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ABSTRACT

This notebook for grade 3 is one of a series developed in response to the concern for energy conservation. It contains activities that stress an energy conservation ethic and includes many values clarification activities for grade three. The packet is divided into two parts and provides the teacher with background information, concepts and objectives, and activities for each part. Basic goals for the activities involve energy's affect on our lives, available energy sources, and energy conservation. Two annotated bibliographies, one for teachers and the other for students, are also included. The teacher is provided with ditto and transparency master pages to use in the classroom. An evaluation sheet and a list of resources are also a part of this activity packet. Revisions include updated statistics, revised background information, two additional solar activities and a revised bibliography. (Author)

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ED204183

ENERGY

Conservation Activity Packet

Grade 3

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ENERGY CONSERVATION ACTIVITY PACKETS

Ruth Bakke
project writer/coordinator

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INTRODUCTION TO ENERGY PACKETS

The energy shortages and emergencies with which we are faced attest the treatment humans have given to their natural surroundings. Not only do we experience personal inconveniences, but we also see severe economic and environmental consequences. Our nation has arrived at a time when it needs to reevaluate where it is going, at what speed, and how it will eventually arrive at that goal. The National Academy of Sciences generally agrees that the reserves and resources of domestic oil, gas and coal will satisfy energy needs in the United States until the year 2000. Presently the United States doubles its energy consumption every 13 years. In 1975, electric companies burned 507 million barrels of oil to generate electricity, 500 million barrels were burned to heat factories. Much of the oil and natural gas consumed could be replaced by coal, thus drastically reducing oil imports.

The instructional program in a school can examine this energy situation with reason and logic. When a social issue is integrated into the total curriculum, it helps children to apply what they are learning. The educational process can help students become aware of the alternatives and consequences in regard to energy, then guide them to choose a value. Students can learn that it is just as exciting to make something last as it is to develop something new.

Through use of the enclosed materials and activities, it is our intent to stress a conservation ethic. The conservation ethic means more than turning lights off; it has wider implications such as developing new industries to recycle metals, making more durable products, and prioritizing fuel uses.

Our values show what we tend to do with our limited time and energy. They are related to the experiences that shape them. In order to help children develop clearer values, teachers must help them use the process of valuing.

Choosing	(1)	freely
	(2)	from alternatives
	(3)	after thoughtful consideration of the consequences of each alternative
Prizing	(4)	being happy with the choice
	(5)	willing to publicly affirm the choice
Acting	(6)	doing something with the choice
	(7)	repeatedly, incorporating in some pattern of life

Students become much more purposeful when they have been given opportunities to clarify their values.

Each packet contains values clarification exercises designed to carry out the stated objectives. The teacher may wish to use a specific model to

develop more exercises. You will find that the valuing process is another tool for the teacher. When used, it leads children from apathy and confusion toward positive learning and life-styles.

The goal of providing the types of activities, which have been included, is to create a growing awareness for the need of dealing with existing energy problems in a positive way. Individual teachers should select objectives which they feel reflect the needs of a particular class. Each packet contains an energy goal and an awareness or accommodation objective. It is imperative to include objectives from each conceptual area as the purpose of these packets is to develop an energy conservation ethic within the students of today that they may become conserving and concerned citizens of tomorrow. Changes may not occur immediately due to home and parental values; however, as they become adults, this learning will show its effects.

Each packet includes many activities for the teaching towards the stated objectives. Teachers need choose only those activities which they feel will accomplish their objectives. As there are often many activities suggested for an objective, the teacher may choose to prepare and offer multiple activities. This could allow students to choose the activity they find most interesting. The teaching of energy and its conservation is designed to be interdisciplinary in order that students see that energy cannot be isolated from our daily lives. This is also important in developing the conservation ethic.

Within the packet, teachers will find transparencies, posters, filmstrips, etc. which may add to the teaching of energy and development of conservation. (These supplementary sheets are grouped together at the end of the notebook behind the colored divider page.) These visual materials plus the activity sheets can be adapted for many uses beyond those suggested, even though a variety of presentation methods is inherent in the notebooks. For example, class, small group, individual, and even family activities are included. In fact, each packet has at least one student interest center or learning station sheets included in the supplementary sheet section. Suggestions and criticisms from teachers, consultants, etc. would be appreciated and considered in keeping these packets suitable for the majority of school systems.

Most young children (7-11) years are in the concrete operational stage as named by Piaget. Such students consider real, concrete things in a systematic, but not abstract manner. Therefore, the activities which have been proposed reflect this and provide for greater awareness, rather than a formal study of energy. Individual teachers know their students best and will need to select items which they feel will be of greatest benefit to the education of the children. This is also the reason the concepts and objectives for the primary grades (K-2) have been combined in one packet. There are some classroom activities which require about 20 minutes each, some 40 minutes, and there are also some activities which can be done at home in order to enable children to work with their families.

AN OVERVIEW OF THE CONCEPTUAL DEVELOPMENT OF K-6 ENERGY PACKETS AT A GLANCE

ENERGY GOALS

K-2 The learner becomes aware that all living things require energy.

The student becomes aware of sources of energy within the learner's home and school.

The learner becomes aware of uses of energy.

Grade 3 The learner develops an understanding of how energy affects our lives. (Packet A, Goal 1.00)

The learner examines the available energy sources. (Packet B, Goal 1.00)

Grade 4 The learner becomes aware that energy can be changed from one form to another - conversion. (Packet A, Goal 1.00)

The learner considers energy, its production, use, and conservation as essential in the maintenance of our society as we know it. (Packet B, Goal 1.00)

Grade 5 The learner develops an understanding of fossil fuels and uses. (Packet A, Goal 1.00)

The learner recognizes the involvement of energy in Iowa's past, present, and future. (Packet B, Goal 1.00)

Grade 6 The learner recognizes limits of energy sources. (Packet A, Goal 1.00)

The learner develops an understanding of alternative sources of energy. (Packet B, Goal 1.00)

Personal Awareness or Accommodation Goal

All packets focus on encouraging the development of a conservation ethic. The Personal Awareness or Accomodation Goals are "Goal 4.00" in the white K-2 notebook and "Goal 2.00" in both packets, A and B, within the 3, 4, 5 and 6 grade level notebooks. Activities in this section encourage students to question the personal importance and implications of that which has been experienced. They utilize the values clarification approach described by Raths, Harmin, and Simon in Values and Teaching.

ENERGY CONSERVATION ACTIVITY PACKETS

GRADE 3

PACKET "A"

TEACHER BACKGROUND MATERIAL
Grade 3 - Packet "A"

How closely is energy related to man and the life he lives? It wasn't long after the 1973 oil embargo that people were colder, gas tanks were more difficult to fill, travel was reduced. Later effects were higher prices, product shortages, unemployment, and depressed industries such as, steel, recreational vehicles, automobiles, clothing, fertilizer, etc. It was during this embargo that everyone became aware that, in addition to food, clothing and shelter, humans also must have energy.

Not only is there difficulty in handling supply and demand, there are also definite threats to the environment. One of the first indicators of extreme stress on the environment was air pollution. The biggest contributor to air pollution is the automobile and second is the fossil fuel generating plants. Water pollution problems indicated that water is a crucial ingredient in the energy web as it is used in washing minerals and in cooling. Energy cannot be studied independently from the environment as they are so closely entwined. Environmental problems also arise when energy is converted to use by humans. In order to convert the stored energy from fossil fuels we burn them. This burning process produces smoke and heat. Heat is a desired product, but there are times when it becomes a waste product and emerges as a pollutant. Nuclear energy, another source of energy, also exhibits environmental hazards: radioactive pollution and radioactive waste storage.

Cities are now warmer than the countryside thus causing changes in rainfall, snowfall, wind speed, etc. Tall buildings act as a heat trap. Most of the extra heat in the cities comes from the sun (almost 3/4 of the extra heat comes from the sun) but it does not have an opportunity to be dissipated by evaporation.

Changes in life-style will need to be made in order to make a change in energy consumption and energy-related environmental problems.

Many of the activities in the 3rd grade packets require between 20 and 40 minutes, depending on length of discussion. Some of the activities are to be done at home and discussed in the classroom.

GOALS AND OBJECTIVES IN ENERGY CONSERVATION

Grade 3 - Packet "A"

Energy

Goal 1.00 The learner develops an understanding of how energy affects our lives.

The learner:

1.1 Becomes aware of the concept of a standard of living and its relationship to energy use.

1.2 Investigates that various energy sources and uses have differing impacts on the environment.

1.3 Discovers that energy is necessary for growth.

1.31 Recognizes that energy is necessary for body growth.

1.32 Recognizes that energy is necessary for industrial growth.

1.4 Becomes aware that food chains or food webs describe the paths by which energy affects all living organisms.

1.5 Sees that utilization of leisure time is dependent upon energy.

Personal Awareness

Goal 2.00 The learner will develop an awareness of energy conservation.

The learner:

2.1 Discovers ways by which energy may be conserved in the home, school, and community.

2.2 Becomes aware that he/she can do something to conserve energy.

2.3 Begins to use the decision-making process learned in K-2.

2.4 Develops an idea of the type of life-style desired or denied in consideration of the amount of energy required.

ENERGY ACTIVITIES
Grade 3 - Packet "A"

Goal 1.00 The learner develops an understanding of how energy affects our lives.

Objective 1.1 The learner becomes aware of the concept of a standard of living and its relationship to energy use.

A. Ask the students to think of things they could do that do not require energy. From this simple discussion idea they can be brought to see how energy is an integral part of their lives. Ask what types of energy they used from the time they awoke until they got to school. Role-play, list on board, etc. (1.1)

B. Role-play or have the class write a short play to present how energy is used in a home. (1.1)

C. Divide the class into small groups and tell them to make three lists. One list should include ways in which energy is used in the home, a second list describes ways in which energy is used in the school, and the third list describes ways in which they use energy. *Master #1*, pg. a could be used for the group. Discuss these lists as an entire class when they are completed and combine into one big list to be posted. (1.1)

D. On sheets of construction paper have the students make a collage of magazine pictures which show the many uses of energy in the U.S. today. These can be displayed for class use or developed into a booklet. (1.1)

E. Take a field trip through a museum and have the students discover the way life-styles have changed and how the amount of energy required has changed with the change of life-styles. Have the children make drawings showing these changes. These can be included in a booklet. (1.1)

F. List the characteristics that distinguish a high standard of living from a low standard of living. If studying people from around the world, or a specific region, compare their standard of living to that in the U.S. (1.1)

G. Use *Data Sheet #1*, pg. b to list all of the energy users the students personally own or use (such as radios, toys, appliances, etc.). In addition they will also state the type of energy required (such as AC battery, wind-up spring, etc.). Then compare their lists with the items they might own in a nation which uses less energy. (1.1)

H. The students list the electrical appliances in their homes in the order of their importance (cooperate with the family). On the back of the sheet they put the ones they feel could be eliminated without lowering their "quality of existence." *Data Sheet #2*, pg. c (1.1)

I. Ask students to explain why people do not wish to do without those convenience items that consume electricity. They could interview parents, neighbors, etc. to help them in the discussion. (1.1)

J. Show pictures with examples of how energy affects the lives of everyone. Students could make their own slides if the school has cameras you could use. Small groups could be assigned to different areas such as transportation, residential, industrial, commercial, etc. (1.1)

Objective 1.2 The learner investigates that various energy sources and uses have differing impacts on the environment.

A. Establish a traffic counting station at an intersection near your school. Divide the class into teams or groups which would observe and count the traffic for 10 minutes at each of three different times during the day for one week. Display the results in chart form, showing the types and numbers of vehicles. *Data Sheet #3*, pg. d

1. At what time of the day was the traffic heaviest and when was it lightest? Why?

2. Were there times when the traffic seemed troublesome?

3. Were there many buses? Should there be more? Why?

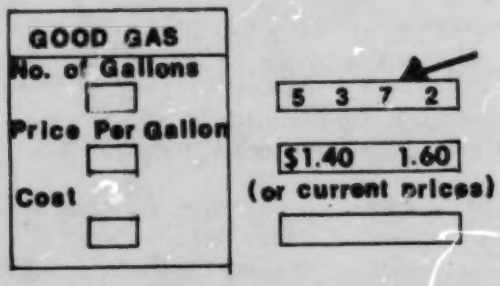
4. Should there be fewer cars? Why?

If it is not possible for your class to spend much time on a project, use similar preparations but have the children make a listing of the first 100 vehicles to pass by their station. *Data Sheet #4*, pg. e

1. How many automobiles had only one person in them?

2. Did many of the vehicles seem to release large amounts of exhaust and fumes? (1.2)

B. As a follow-up, or reinforcement activity, set up a problem solving activity station entitled "Gasoline Station Helper." On a poster board or bulletin board put a facsimile of a gasoline pump. Supply three tagboard strips for the slots on the pump. Groups of two can work out problem solving situations. (1.2)



C. Let the students select various members of the community to interview. In the interview they should find out whether they have experienced energy shortages and what they were. The students could also ask these people what energy they use and how they think it affects the environment. Results of the interviews should then be shared with the entire class and discussed. (1.2)

D. List at least five energy sources on which you depend from the time you get up until your class begins. How does this use of energy affect the environment? Attempt to point out specific examples of the effects. Activity E could aid the discussion. (1.2, 2.4)

E. Show pictures depicting scenes of how energy has an impact on the environment. Teachers may wish to make slides of their own or have the class develop some with local examples. (1.2)

F. The energy crisis has led many people to be interested in power sources that can be substituted for fossil fuels. Sunlight is one such alternative. Solar energy is often a feasible source for heating the interior environments of homes, schools, and office buildings.

The idea of solar gain is fundamental. Solar gain refers to the accumulation of heat from the sun inside a building. This is desirable when the outside temperature is lower than the temperature to be maintained inside the building. Solar gain is most useful when it can be stored inside the building for use later when the sun is not shining. Cement, masonry, and stones are good construction materials for the storage facility in passive solar buildings. (1.2)

The idea of solar gain can be experienced by students.

1. Have the student sit in indirect sunlight inside the school for 3 minutes.

2. Have the student describe how he/she felt orally or in writing, especially concerning temperature.

3. Next the same student should sit in direct sunlight for 3 minutes.

4. The student should again describe his or her feelings.

5. As a summary discuss:

   a. Differences between the two situations.

   b. The cause of the differences.

   c. The definition of solar gain.

   d. When solar gain inside a house is desirable.

E. Shadow Searching

One of the most obvious but most overlooked effects of the sun on our environment is the casting of shadows. Actually two environmental areas of emphasis are most affected - architecture and landscaping. For example, solar rights has become a legal issue in many states including Iowa because of the prominence of solar homes and the resulting necessity of unblocked access to the sun's rays. In regard to landscaping, plants must be carefully selected because of the various requirements different plants have for sunlight, and because of the unique amounts of shade and sunlight available on specific sides of buildings. Another aspect of landscaping and sunlight is the manner in which certain trees and bushes block sunlight from reaching inside a building. For example, evergreens and some pin oaks consistently shade a house, even in the winter when the sunbeams would be desirable.

The basic reasons behind such concerns can be discovered by children through "Shadow Searching". Consider the following suggestion. (1.2)

1. Discuss with students their ideas about shadows-not only what they are and how shadows move, but also the effects shadows have on our environment. Be careful not to color the discussion with your ideas as the students can test their ideas on their search.

2. With students working with a partner or alone, have them go on a shadow search around the school grounds. It works best to choose a time when shadows are long, 9-10 a.m. or 2-3 p.m. Have students fill in the chart *Data Sheet #5*, pg. f as they explore. A suitable amount of time as determined by the teacher should be allowed, perhaps 10 minutes.

Several examples of shadows should be located. If possible, types of plants or the building should be specified under "Cause of the Shadow". The "Description of the Shadow" refers to darkness, size, and shape. Explain that "cast" means where the shadow is thrown or directed.

3. After the search, have pairs answer the questions on *Data Sheet #5*, pg. f.

4. As a summary, have each group report one thing they learned or discovered in the activity or discuss the questions on the bottom of the chart.

5. After the discussion, it is desirable to go outside as a group to observe some of the shadows and causes of the shadows. Be mindful that some changes may have occurred.

Objective 1.3 The learner discovers that energy is necessary for growth.

A. Plant two terrariums with grass. Place one in the light and one in the dark. After two weeks observe the differences in growth. Don't forget to water your plants! Ask the class what caused the differences. Establish that the sun provides energy for growth. (1.3)

B. The chidren can chart their food consumption for five days. With the help of a calorie chart they can then calculate their caloric intake. *Data Sheet #6*, pg. g. Discuss calories in relation to amount of energy. Do all bodies need the same number of calories? What happens to them? (1.3)

C. Take a field trip or write a letter to a local or nearby industrial plant. Find the plant's use per day of electricity and other forms of energy it uses. Discuss the product, its use, and its importance to society. How rapidly has the plant grown and how is energy related to its growth? These questions can be included in your letter or when you visit. (1.3, 2.4)

Objective 1.4 The learner becomes aware that food chains or food webs describe the paths by which energy affects all living things.

A. Collect pictures from nature magazines and construct a collage illustrating a simple food web. The students should be participants in this process of collecting pictures and constructing a class collage. (1.4)

B. Write an original story which explains what happens to the other members of a food chain when one is removed. Several of these can be shared orally and all can be displayed with the collage from the previous activity. (1.4)

C. If the class has access to a camera, they can take pictures of the members of a food chain in the local environment. These can then be displayed on a bulletin board. (1.4)

D. Discuss *Transparency #2*, pg. h which depicts the energy path. Let children explain what they observe before giving detailed information. They could then show other energy paths on drawing paper. (1.4)

Objective 1.5 The learner sees that utilization of leisure time is dependent upon energy.

A. Show pictures of leisure time activities. Allow time for discussion about each one to establish the amount of energy involved, including transportation to the area. (1.5)

B. Collect data on activities various members of the family engage in during leisure time. Use *Data Sheet #7*, pg. i. What sources of energy are necessary to accomplish each activity? (Include travel to and from, energy required by the person, etc.) (1.5)

C. Write stories which would relate events, feelings, etc., when you would have a day without electricity. Sharing aloud of these stories would reveal whether there is a good understanding. (1.5, 2.4)

Goal 2.00 Personal Awareness: The learner will develop an awareness of energy conservation.

Objective 2.1 The learner discovers ways by which energy may be conserved in the home, school, and community.

A. Hold an "Absolute Minimum Energy Consumption Day" (AMECD) or "Save Energy Day" for the school. Obtain permission from the principal to announce there will only be cold lunch, no electric clocks, bells, or intercoms, and no electrical audiovisual equipment is to be used. Ask for feelings from the students when the day is over. What did they learn? (2.1)

B. Make posters showing how to save energy. Display these around the school and in windows of local businesses with their permission. Possible ideas: DO NOT WASTE PAPER, WEAR WARM CLOTHES, TURN OFF LIGHTS WHEN YOU LEAVE THE ROOM. (2.1)

C. Students make individual lists of all the things they intend to do in order to save energy in school. These could be in the form of a progress chart with the progress reported daily or they could be in the form of a bulletin board display. (2.1)

D. Stage an "Information Campaign" complete with a slogan contest, poster competition, song contest, outstanding class project, and an energy conservation assembly. Attempt to get newspaper, radio coverage, etc. (The songs are simple to do if you have the students select the tune of a simple or popular song such as "Yankee Doodle" or "Twinkle, Twinkle Little Star" then let them make up words about energy to fit.) (2.1)

E. Bring 10 items such as eggs, milk, lettuce, etc. for the class to put into a refrigerator. Time the duration the refrigerator was open. Then have the class prepare a dinner during which they open the refrigerator each time they need an item. The dinner will be "imaginative" and not really cooked unless the teacher feels it will be more realistic. Time the duration the refrigerator was open during their meal preparation. Help the class realize that by planning and organizing, they can cut the time the door is open, thereby saving energy. Relate this to letting water run while brushing teeth, and other routine activities. There are many such things which mother does in the kitchen--watch her method for washing and rinsing dishes, preparing vegetables, cleaning the sink and counters, etc. (2.1, 2.3, 2.4)

F. Ask other classes to list ways to save energy and see which class can provide the longest list of ways to save energy at home and school. A certificate could be designed by the children and presented to the winning class. (2.1)

Objective 2.2 The learner becomes aware that he/she can do something to conserve energy.

Objective 2.3 The learner begins to use the decision-making process learned in K-2.

A. Make individual energy conservation report cards which are marked by the child or family each week. Use *Master #3*, pg. j. (2.2, 2.3)

B. Provide students with a copy of *Master #4*, pg. k. Ask them to look at the pictures and find the things that are wasting energy. Using a crayon, they should put an "x" through those things that are wasting energy. Discuss as a class and encourage them to explain how energy could be conserved in that situation, rather than wasted. (2.2, 2.3)

C. Have the class write and produce a puppet show to tell how to conserve energy in the home, school, and community. This puppet show could be used to help other classes and to get messages of conservation to the public. Check with any local public broadcasting TV station to see whether they would show the puppet presentation, or video tape if possible. (2.2)

Objective 2.4 The learner develops an idea of the type of life-style desired or denied in consideration of the amount of energy required.

A. Values Voting--Values Clarification Activity

This activity provides a simple and quick method by which the students can publicly affirm their values on issues. Voting is an effective way to introduce values issues into the classroom and to stimulate student interest. Voting lists are not long--up to 10 items. Discussion may or may not follow. The teacher votes too, but holds his or her vote until a split second after most of the students have committed themselves. This is to prevent influencing the vote.

Each question should be prefaced by the statement, "How many of you...?" Any of the items may be opened for discussion and this discussion can be held until interest lags. (2.4)

How many of you...

1. _____enjoy watching movies on TV?
2. _____have read a book just for fun in the last three weeks?
3. _____play sports activities with your family?
4. _____have your parents transport you everywhere you have to go?
5. _____think the energy problems in our country are "made up" by the utility companies?
6. _____think the energy shortages are real?
7. _____have high utility bills at home?
8. _____think we could help conserve energy by our actions?
9. _____enjoy handmade gifts as much as expensive toys?
10. _____have discussed with your family ways to conserve energy?

B. Values Whips--Values Clarification Activity

This procedure provides a simple and rapid means for both the students and teacher to see how others react to various issues or questions. The class should be instructed that their answers are to be brief and to the point. Students may choose to pass. The teacher poses a question to the class and provides a few moments for them to think about their answers. The teacher then whips around the room calling upon students for their answers. (2.4)

Sample Questions

1. What is one thing you would change about use of energy in your school?

2. What is one thing you would change about use of energy in your home?
3. What is one thing you would change about use of energy in your town?
4. What is one thing you would change about use of energy in your neighborhood?
5. Would you be willing to limit car usage in order to reduce gasoline consumption?
6. What has your family done in order to lower their utility bills?
7. How will you convince someone else about the energy problems and what to do?
8. What is something you have done about the energy issue that you are proud of?

LEARNING STATION ACTIVITIES

If the teacher wishes to use learning stations in teaching about energy, two learning stations could be developed utilizing some of the activities in this packet: Learning Station #1 uses *Masters #5, 6, 7*, pp. l-n and Learning Station #2 uses *Masters #8, 9*, pp. o-p. The teacher provides copies of the various masters and makes them available with appropriate materials to the students. The individual teacher decides the length of time students should spend at each station.

ENERGY CONSERVATION ACTIVITY PACKETS

GRADE 3

PACKET "B"

TEACHER BACKGROUND MATERIAL
Grade 3 - Packet "B"

It is possible that within the next 100 years we will have exhausted the world's supply of fossil fuels except for coal. As fossil fuels rapidly diminish and our rate of energy consumption continues to rise, we will be confronted with a variety of problems. For instance, How will electricity be produced? Should fossil fuel supplies be preserved and utilized in raw materials in the manufacture of clothing, plastics, and medical drugs?

The U.S. has about 1/3 of all the world's coal and it appears to be the answer for the immediate future. However, the fact must be faced that every effort must be made to conserve what we have and develop alternatives such as geothermal, solar, wind, nuclear.

America has been the largest consumer of oil, natural gas, and coal. It is quite an impact to realize that although the U.S. population represents 6% of the world's population, it consumes 1/3 of the world's energy. The U.S. energy supply has been accessible and relatively inexpensive, therefore Americans have taken energy resources for granted and considered them to be inexhaustible.

Americans have had the highest standard of living in the world, money to purchase all the energy they wanted, and live with piles of nonessential energy consuming items. The fact that we have become a mobile nation has also greatly affected our energy consumption and life-style.

Our growing demand for energy has been met by importing more and more petroleum from foreign suppliers. However, there is danger in this dependence on foreign suppliers because the supplying nation can use energy as a political weapon. It is extremely important that the U.S. become energy independent.

Many of the activities in the 3rd grade packets require between 20 and 40 minutes depending upon the length of discussion. Some of the activities are to be done at home and follow-up provided in the classroom.

GOALS AND OBJECTIVES IN ENERGY CONSERVATION

Grade 3 - Packet "B"

Energy

Goal 1.00 The learner examines the available energy sources.

The learner:

1.1 Becomes aware that the location of cities and industries is influenced by access to energy sources.

1.2 Develops map skills by locating current and possible future fuel locations.

1.3 Recognizes that human beings transform and use energy sources to satisfy their wants.

Personal Awareness

Goal 2.00 The learner will develop an awareness of energy conservation.

The learner:

2.1 Becomes aware that he/she can do something to conserve energy at home, at school, and in the community.

2.2 Begins to use the decision-making process learned in K-2.

2.3 Develops an idea of the type of life-style desired or denied in consideration of the amount of energy required.

ENERGY ACTIVITIES
Grade 3 - Packet "B"

Goal 1.00 The learner examines the available energy sources.

Objective 1.1 The learner becomes aware that the location of cities and industries is influenced by access to energy sources.

A. Guide the class in studying *Transparency #1*, pg. q which depicts major cities. Use as an overlay, *Transparency #2*, pg. r, which shows land use (mining). Discuss whether cities seem to have developed around mining areas. (1.1)

B. Energy Walk

This can be done as part of another field trip or mainly for the purpose of locating where and what kinds of energy are used in your town. Before beginning the walk, review the different forms of energy the community consumes (electricity, wind, moving water, gasoline, etc.). Walk around the town or city and notice where and what kind of energy is used. After returning to the classroom, the children may draw pictures of energy at work as they saw it. *Data Sheet #1*, pg. s, will help the students in gathering information about energy on their trip. (1.1)

C. Energy in _____

Distribute a map of the county, area, or state to the students. On the map children locate their home, school, hospital, and/or local fire department. Then have them list the forms of energy used in home, school, hospital, and/or fire department. Discuss what evidences of energy are found in their neighborhood. (1.1)

D. Compare a settlement of long ago with a city of today. Ask the students how a city becomes a city. This works in very well with a study of cities, population, etc. (1.1)

E. Have students list examples of five forms of energy within the community. Then ask them to explain why these forms of energy are important to the world in which we live. Using one of the forms, let the students explain its origin. Drawings or pictures from magazines could be put together to show how this energy is used. (1.1)

F. Invite parents who have jobs related to energy sources to come to class and discuss their work. Other parents could be invited to discuss how they use energy. (1.1, 1.3)

Objective 1.2 The learner develops map skills in locating current and possible future fuel locations.

A. On a world map, locate important energy fuels and major energy users. This exercise provides practice in interpreting maps and reading them. (*Transparencies #3, 4, 5*, pp. t-u). (1.2)

Transparency #3, pg. t

It may be interesting to point out that the largest percentage of the world's coal supply is located in the following countries:

U.S.	31%
U.S.S.R.	23%
People's Republic of China	14%

Transparency #4, pg. u

The following countries hold these percentages of the world's crude oil supply:

Saudi Arabia	26%	Iraq	5%
Kuwait	11%	Mexico	5%
U.S.S.R.	10%	U.S.	4%
Iran	9%		

Transparency #5, pg. v

The majority of the world's supply of natural gas is distributed between the following countries:

U.S.S.R.	35%	Algeria	5%
Iran	19%	Saudi Arabia	4%
U.S.	8%	Canada	3%

B. Locate on a map the countries that have large energy resources and compare them with those countries that use large amounts of energy. (*Transparency #6*, pg. w). This also provides opportunity in developing map skills. (1.2)

C. The teacher makes large size copies of the continents, has the children push their desks back against the walls, and lets them place the continent shapes on the floor. Help them discover population for the areas and then assign children to represent population. They could wear colored armbands to represent their area. Then assign fuel to the areas in relation to how much each uses. Those who use the largest amounts of energy can use any of the conveniences in school during the day; those using less would not be allowed to use all conveniences. After one day let them discuss their feelings about energy use. (1.2, 1.3, 2.4)

D. Read the class the reprint from Ranger Rick entitled "The Best Present of All." A single copy is available free from the National Wildlife Federation, 1412 Sixteenth Street, N.W., Washington, D.C. 20036. The class might also enjoy presenting it as a play or a puppet show. (1.2)

Objective 1.3 The learner recognizes that human beings transform and use energy sources to satisfy their wants.

A. Provide students with a copy of *Master #1*, pg. x, which is a puzzle in which they find words related to wants, needs, and energy. When they have finished, talk about what is a need, what is a want, and forms or sources of energy. (1.3)

B. The children make a collage of magazine pictures which illustrate the many uses of energy in the United States today that supply or satisfy our wants rather than our needs (dishwasher, electric toothbrush, electric razor, TV, etc.). (1.3)

C. The children write creative stories which tell about what life would be like without a certain kind of energy. (Example: electricity) (1.3)

D. Wastebasket Survey

At the end of a day have the children empty the contents of the wastebasket on newspaper which has been spread. As they go through the contents, have them categorize them into piles--those things that could be used again and those things which cannot be used again. Looking at the pile of things which cannot be used again, ask the children:

1. Did these things provide us with our needs or with our wants?

2. How many of these things could we do without?

3. Can any of these thing be recycled--used to make more of the same?

The wastebasket could be checked each day for one week to see if a change is taking place. (1.3)

E. Have the children compare free-time activities of long ago with those of today. Do the free-time activities of today require more energy than those of long ago? Pictures could be made showing the types of activities. Ask the children if these free-time activities are necessary for people or whether they are luxuries. (1.3)

F. In order that students better understand why Americans use so much energy today, provide them with copies of *Master #2*, pg. y. The students check the boxes of those items which they now have. Then they should take the list home and check with parents and grandparents as to the things they had. These should be returned and discussed. (1.3)

Goal 2.00 Personal Awareness: The learner will develop an awareness of energy conservation.

Objective 2.1 The learner becomes aware that he/she can do something to conserve energy at home, at school, and in the community.

A. Have the children think of things that can be used in place of another, such as: crayon for pencil, chalkboard for paper, broom for vacuum. Use *Data Sheet #2*, pg. z. It might be interesting to see which student comes up with the longest list. (2.1)

Objective 2.2 The learner begins to use the decision-making process learned in K-2.

A. Tell the children that they may plan to celebrate everybody's birthday but that only one box of birthday candles can be used. They then plan conservation measures so each celebration will be equally nice. This could be planned by the class, groups, or individuals. (2.2)

B. Announce that water (or some other item such as paper towels, clay, paper for dittos, etc.) is limited and must be rationed. What you have must last through a certain period of time. Let the class explore ways to live with this and actually have them do it for a week. (2.1, 2.2)

C. Credit: Environmental Education, K-3 Activities, Division of Science Education, North Carolina State Department of Public Instruction, Raleigh, North Carolina 27611.

After talking about energy conservation, have the children complete sentences such as those on *Master #3*, pg. aa. This would indicate how clearly each student understands the idea of conservation. (2.2)

Objective 2.3 The learner develops an idea of the type of life-style desired or denied in consideration of the amount of energy required.

A. Bring a lollipop and ask the children what would happen to it if you were to take bites out of it. Then ask if there would be any way to make it last longer. Write the word "conserve" on the board and explain that

using less of a product, or using another to do the same thing conserves. Then send six children to the chalkboard and pass out three pieces of chalk. Ask if there is enough chalk then ask what the alternatives (choices) would be. After listing several of the alternatives on the chalkboard, ask the children which solution they favor. (2.2, 2.3)

B. Ask the students to describe five ways electric energy has made their life better. Ask whether they would be willing to give up any of their uses of electricity in order to conserve. What would each give up? (2.2, 2.3)

C. Send home a copy of *Master #4*, pg. bb, with each student. This letter is designed to initiate family discussions in regards to energy and energy conservation. (2.2, 2.3)

D. Provide each student with a copy of the Conservation Quiz, *Master #5*, pg. cc. This will provide a means of evaluation for understanding of energy and energy conservation. (2.3)

E. Pattern Search--Values Clarification Activity

Use *Master #6*, pg. dd. This is designed to help students become aware of patterns they have and motives for doing things in a pattern. Once the students have filled in the grid they may then break into small groups and choose one of the items to discuss for 10 minutes. New groups can be organized and a new item discussed. Before letting the students complete the grid on their own, lead them through the first two or three questions. Compulsion can be interpreted for the students as meaning someone makes them do it. It works well as a final activity to have the students look at the last section of the grid where they responded to the question, "Do You Prize Your Answers?," and ask whether they have more checks under "yes", "no", or "?". Tell them that if they have more under "no" and "?" they should think about their lives more carefully. (2.3)

F. Values Whips--Values Clarification Activity

This procedure provides a simple and rapid means for both the students and teacher to see how others react to various issues or questions. The teacher poses a question to the class and provides a few moments for them to think about their answers. The teacher then whips around the room calling upon students for their answers. The class should be instructed that the answers are to be brief and to the point. Students may choose to pass. (2.3)

Sample Questions

1. What is something about energy you heard in the news lately that really disturbed you?

2. How much time do you spend worrying about energy and future energy sources?

3. What do you want to do about the energy shortages?

4. What form of energy would you be willing to use instead of natural gas, coal, and petroleum?

5. What is one thing about which you have changed your mind recently?

G. Public Interview--Values Clarification Activity

The teacher asks for volunteers who would like to be interviewed about their beliefs, feelings, and actions on energy. The volunteers sit at the teacher's desk or in a chair in front of the room, and the teacher asks the questions from the back of the room. The first few times the teacher reviews the ground rules. If the student answers the question, he must answer honestly. However, the student has the option of passing if he does not wish to answer any one or more of the questions. The student can end the interview at any time by saying, "Thank you for the interview." (2.3)

Sample Interview Questions

1. Do you use a lot of energy for your family activities?
2. What did you like about your summer vacation?
3. What could you have done differently in order to conserve energy?
4. Do you and your parents enjoy watching the same TV programs?
5. How much TV do you watch?
6. Who selects the RV programs, you or your parents?
7. What could you do if you could not watch TV?
8. Do you think department stores should be open on Sunday?
9. What have you done to increase an energy shortage?
10. What have you done to conserve energy?

H. I Learned Statements--Values Clarification Activity

This activity provides feedback about a specific activity which has been participated in. It helps clarify what the students have learned and also serves as reinforcement. The teacher prepares *Chart #1*, pg. ee, with sentence stems and this can be posted permanently in the room or just when it is used. Students are not called on, but volunteer to speak whenever they feel comfortable about it.

It is sometimes helpful the first time around to have students write down a few "I Learned Statements" before sharing them aloud. The teacher could also provide one or two specific examples. Do not allow discussion to interrupt the free flow of statements as it tends to destroy a mood. Attempt to help students focus on personal learnings rather than on general ones. Reassure the students that there are no right answers. Students have the freedom to pass. (2.3)

Sentence Stems

I learned that I...
I re-learned that I...
I noticed that I...
I discovered that I...
I realized that I...
I was surprised that I...
I was pleased that I...
I was displeased that I...

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Cooperative Extension, New York State, Save Energy, Save Dollars, available for $1.50 from Mailing Room, 7 Research Park, Cornell University, Ithaca, NY 14853. This collection of articles offers practical advice to homeowners, prospective homeowners, and consumers on ways to conserve energy in daily living.

Department of Energy (DOE) energy education materials are available free of charge from: U.S. Department of Energy, Technical Information

Center, P.O. Box 62, Oak Ridge, TN 37830. Ask for current list of their many titles. Order in advance; two months waiting time for delivery is typical. Some representative titles are:

Careers in Energy Industries
Energy in Focus: Basic Data
The First Reactor
Flywheels: Storing Energy as Motion
Gas Mileage Guide for New Car Buyers
How to Save Money by Insulating Your Home
How to Understand Your Utility Bill
Nuclear Energy
Nuclear Power in Space
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Solar Energy for Heating and Cooling
Tips for Energy Savers
Tips for the Motorist: Don't Be Fuelish

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Department of the Interior, Geological Survey. Natural Steam for Power is an illustrated fold-out brochure on one kind of geothermal power. Cost: 25¢ from U.S. Government Printing Office, Washington, DC 20402, Stock No. GPO-19740-548-685.

D.P.I., Energy Conservation in School Facilities. Iowa State Department of Public Instruction, Grimes State Office Bldg., Des Moines, Iowa 50319. Brochure lists specific recommendations for reducing energy waste in school buildings.

Eaton, William W. Energy Technology, Energy Storage, Geothermal Energy, Oil, and Solar Energy are all available free from DOE, Technical Information Center, Box 62, Oak Ridge, TN 37830. Multiple copies for classroom use will be mailed on request. Ask for a current listing of other free publications on a wide range of energy topics.

Edelson, Edward. Alternate Energy Sources is one of many useful free booklets provided to teachers by Edison Electric Institute, 90 Park Avenue, New York, NY 10016.

Energy, A Growing National Problem. Education Servicing Section, National Wildlife Federation, 1412 Sixteenth St., NW, Washington, DC 20036. Single copy free; additional 20¢ each; 50 or more, 16¢ each. The illustrated, 16-page report discusses our energy problem and solutions.

The Good News About Energy is a 49-page report of a 1979 study by the Council on Environmental Quality. It is available from the Executive Office of the President, Council on Environmental Quality, 722 Jackson Place, N.W., Washington, DC 20006. The potential for achieving lower energy growth in the United States and the implications for the economy, the environment, and government policy are discussed.

How to Save Gasoline . . . and Money is an 8-page pamphlet on efficient driving practices. Available free from DOE Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830. Ask for a list of currently available publications on energy-related topics.

Iowa Energy Policy Council. Home Energy Savings Manual is a well-written booklet that provides basic energy conservation measures for the home. It has about 75 pp. and is free. It is available from the Iowa Energy Policy Council, Capitol Complex, Des Moines, IA 50319.

Iowa Power. A series of "Q and A" booklets were developed using a format of questions and answers to discuss the content. Titles are: Gas Safety, Gas Supply, Utility Regulation, Electric Safety, Electric Supply and Profit. Each booklet is about 5 pages in length and is available to customers in the Iowa Power and Light service area in central and southwest Iowa through the local utility office.

Miller, Alan S., et al. Solar Access and Land Use: State of the Law 1977, free, from the National Solar Heating and Cooling Information Center, P.O. Box 1607, Rockville, MD 20850. This is a summary of solar access rights for various buildings depending on solar input for comfort and is part of a larger study, Legal Barriers to Solar Heating and Cooling of Buildings.

Olin, Hubert L. Coal Mining in Iowa, State Mining Board, State of Iowa, Des Moines, Iowa 50319. Early history of coal mining in Iowa and role of coal in development of the state's economy are presented.

Solar Energy - Progress and Promise. Executive Office of the President, Council on Environmental Quality, 722 Jackson Place, NW, Washington, DC 20006. The 42-page booklet discusses progress in the development of various aspects of solar energy utilization.

Your Energy World. Department of Energy, Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830. This 1977 publication is for grades 4-6 and is free.

TEACHER AIDS

American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209, will send teachers free copies of their educational services newsletter, Natural Gas Energy. Reading level is adult. Each issue focuses on one topic. For example, Volume 8, No. 2 is devoted to "Fuels from Biomass." Other recent issues centered on "Synthetic Natural Gas from Peat," "Coal Gasification," "Natural Gas and the Environment," "Energy Balances." Free kits are available such as: Natural Gas Serves Our Community

Kit for grades 4-5 or grades 2-3. A booklet is also offered by the title Natural Gas Serves Our Community Booklet for grades 2-3 or 4-5. Additional free booklets are:

Natural Gas - Science Behind Your Burner
Experiments: Properties of Gas and Heat Energy
How Your Gas Meter Works
Look to the Future - The Gas Company in Your Community
History of Natural Gas
The Story of Natural Gas Energy

Carey, Helen. Award Winning Energy Education Activities for Elementary and High School Teachers. 1977, available at no cost from DOE Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830.

CEL Blocks. Primary Interdisciplinary Environmental Learning Packets, Brevard County, FL. (ESEA Title III, Project #050-2323-73003). Student cards covering areas of environmental education which can be used by teachers in a variety of interdisciplinary ways.

Community Workers and the Energy They Use. National Science Teachers Association, (grade two), 1976, free. Available from DOE Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830.

Curriculum for Appropriate Technology. National Center for Appropriate Technology, P.O. Box 3838, Butte, MT 59701. $5. The packet includes a selection of ten activities about present and future energy systems. Topics covered are: Energy Production and Use, Food and Nutrition, Renewable Resources, plus Cans and Recycling. Posters, handouts, and learning games are included.

Education Packets: Wind Conservation, Solar and Chemical Energy. Simple and well described projects are suggested for upper elementary students. Obtain from: American Museum of Atomic Energy, P.O. Box 117, Oak Ridge, TN 37830.

Edison Experiments You Can Do is available for 50¢ from the Charles Edison Fund, David O. Schantz, Curator, 101 South Harrison Street, East Orange, NJ 07018. This is a collection of several booklets describing 75 experiments related to concepts of electricity. Alternative Energy Sources, Energy Conservation, Nuclear Experiments, and Environmental Experiments are among the topics included.

Energy. Environmental Education Project, ESEA Title III, Section 306 Topeka Public and Parochial Schools, 1601 Van Buren, Topeka, KS 66612 (ED 093 649). Objectives are listed, along with activities which meet the stated objectives. Teachers select only those appropriate to the objectives for their students.

Energy. Michigan United Conservation Clubs, P.O. Box 30235, Lansing, MI 48909. Provides information on the nature of energy, sources and uses of energy, and conservation. There are also some work sheets and ideas for helping others learn more about energy.

Energy. Social Issues Resource Series, Eleanor C. Goldstein, 1975. Social Issues Resource Series, Inc., 1200 Quince Orchard Boulevard, Gaithersburg, MD 20760. Notebook filled with reprints of articles related to energy.

Energy Activities for the Classroom - 1976. Coon, Herbert L. and Michele Y. Alexander, 1976. ERIC Center for Science, Mathematics and Environmental Education College of Education, the Ohio State University, 1200 Chambers Road, Third Floor, Columbus, Ohio 43212. Resource booklet of energy teaching activities divided into grade levels: K-3, 4-6, 7-9, 10-12.

Energy Conservation Classroom Kits 1-3, 4-6. Southern California Edison Company, 1976. Educational Services, Room 397, P.O. Box 800, Rosemead, CA 91770. Colorful kits to help teachers teach about energy conservation. There are folders, inspector cards, stickers, certificates. The teacher's guide contains ideas and lesson plans, in addition to duplicating masters.

Energy Crisis Teaching Resources. Curry, Wendell, et. al., Oregon State Board of Education, Salem, OR, 1973, 59 pp. (ED 085 316). Many very useful activities to be used in stressing individual responsibility towards energy crisis problems.

The Energy Crisis: What You Can Do About It. Standard Oil Company (Indiana), 1973. Mail Code 3705, 200 E. Randolph Drive, Chicago, IL 60601. Folder containing four spirit masters and specific teaching instructions. The spirit masters give information and ask for students to supply some interpretation. Parents and other adults are encouraged to participate.

Energy Education Activities for Elementary and High School Teachers. National Science Teacher Association, 1724 Connecticut Ave., NW, Washington, DC 20036. 1978, Free.

Energy - Environment Materials Guide. Mervine, Kathryn E. and Rebecca E. Cawley, National Science Teachers Association, Washington, DC, 1975, (ED 111 663). Handy source book containing annotated bibliographies for teachers, students. Non-print material.

Energy - Environment Mini-Unit Guide. Smith, Stephen M., ed., 1975. National Science Teachers Association, Washington, DC, (ED 111 664). Materials designed to stimulate decision making in young children and to make teaching more interdisciplinary. It is filled with many activities and guidelines.

Energy and Man's Environment. Jones, John, D.Ed., Editor, 1976. Energy and Man's Environment, Inc., 0224 S.W. Hamilton, Suite 301, Portland, OR 97201. Interdisciplinary teacher's guides to energy and environmental activities. Involves 8 books - Activity Guide, Uses of Energy, Sources of Energy, Impacts of Energy, Limits of Energy, Conversion of Energy, Future Sources of Energy, Glossary.

Energy and Man's Environment - Activity Guide. Ris, Thomas F. Energy and Man's Environment, 2121 Fifth Avenue, Seattle, WA 98121, (ED 106 070). Provides educational strategies and materials needed for

introducing energy to all grade levels on an interdisciplinary basis. Each chapter has four themes: (1) Scientific, (2) Ethical, (3) Aesthetic, (4) Utilitarian.

Energy for Today and Tomorrow. San Diego City/County Schools Energy Education Committee Department of Education, San Diego County, 6401 Linda Vista Road, San Diego, CA 92111, 1975. Activities for students in grades kindergarten through six. These help to create an awareness of the need of dealing with energy problems.

Energy is Basic is a free information pack from the Energy Action Office, Westinghouse Nuclear Fuel Division, P.O. Drawer R, Columbia, SC 29250.

The Energy Show. The New Western Energy Show, 226 Power Block, Helena, MT 59601. It is a script for a puppet or acting show. $3.50.

The Energy We Use. National Science Teachers Association, (grade one), 1976, free. Available from DOE Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830.

Environmental Education: Strategies for Wise Use of Energy. Division of Science Education, North Carolina Department of Public Instruction, Raleigh, NC 27611, c. 1974. Designed for use at all grade levels, therefore, activities are grouped K-3, 4-6, 7-12. An appendix contains charts, glossary, bibliography, checklists.

Get Your Hands on Energy. The New Western Energy Show, 226 Power Block, Helena, MT 59601. A collection of simple, practical, "hands on" projects deals with energy concepts. $3.50.

Living Within Our Means: Energy and Scarcity. Environmental Educational Instructional Activities K-6, The University of the State of New York, The State Education Department, Albany, NY 12234. Instructional manual which illustrates ways in which environmental concerns may be integrated into the curriculum. Excellent activities arranged according to disciplines.

Mickey Mouse and Goofy Explore Energy. Walt Disney Productions, 1976. Public Affairs Department, EXXON, U.S.A., P.O. Box 2180, Houston, TX 77001. Very comprehensive, yet delightfully presented energy comic book. Copies are available from the above address. Covers previous sources of energy and possible future sources.

Nineteen Fact Sheets On Alternative Energy Sources. (1977) Sheets include wind; bioconversion; solar, ocean, geothermal, and nuclear power; coal-derived fuels; conservation; energy storage; environmental impacts; a glossary and a bibliography are also results of NSTA/DOE cooperation. The sheets are available from the Department of Energy, Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830. The materials were prepared by the National Science Teachers' Association.

North Carolina DPI, The Energy Conserver, available on request from the Division of Science Education, Room 284 Education Building, Raleigh,

NC 27611, is a monthly newsletter full of tips on energy and schools, conservation projects, and classroom activities.

Student Learning Activity Module "The Energy Crisis". Hughes, Judi and Lee County Environmental Education Program, Title III ESEA, 2266 Second Street, Fort Myers, FL. Contains lesson plans, resource materials, and a Student Teaching Module on energy. Developed to help create an awareness of the causes, and some solutions for the energy crisis the world is facing.

A Teacher's Guide For Energy Conservation. Contact: Jonathan Wert, Environmental Center, University of Tennessee, South Stadium Hall, Knoxville, TN 37916.

A Teacher's Handbook on Energy. Interstate Energy Leadership Project, Colorado Department of Education, 201 E. Colfax Ave., Denver, CO 80203.

Ways to Environmental Education; Volume III, Allen, Rodney F., Ed. and Others. Florida State University, Tallahassee College of Education, Tallahassee Junior Museum, FL, 1975, 150 pp. Ten environmental booklets in one volume. One booklet covers energy learning activities for camp and home.

Wide World of Energy Kit. Walt Disney Productions, 1976, Walt Disney Educational Media Company, 500 South Buena Vista Street, Burbank, CA 91521. Kit contains cassette and color filmstrip titled, "The Search for Power and Energy;" 18 full-color study prints; Energy Game; 30 copies of the energy comic book, "Mickey Mouse and Goofy Explore Energy;" 10 energy activity cards; teacher's guide with information and additional activities.

PERIODICALS

ALTERNATIVE SOURCES OF ENERGY features articles on many aspects of alternative technologies and is a clearinghouse for practical ideas on energy sources. Bi-monthly, $10/yr. from Alternative Sources of Energy, Inc., Route 2, Box 90A, Milaca, MN 56353.

CURRENTS is a survey of solar legislation, research, workshops, and alternative energy issues in Iowa. Published by Citizens United for Responsible Energy, 3500 Kingman Blvd., Des Moines, IA 50311 at $5/year.

EARTH JOURNAL, published quarterly, regularly features energy-related subjects. Costs $3/yr. from Minnesota Geographic Society, P.O. Box 6181, Minnehaha Sta., Minneapolis, MN 55406.

ENERGY AND EDUCATION, a bi-monthly newsletter is available free from NSTA, 1724 Connecticut Ave. NW, Washington, DC 20036. It features energy facts and news of educational programs across the country.

FREE ENVIRONMENT NEWSBRIEFS. Published eight times per year by Free Environment, Inc., Activities Center, Iowa Memorial Union, Iowa City, IA 52242 - $2. Deals with all types of environmental issues.

IOWA ENERGY BULLETIN. Published monthly by Iowa Energy Policy Council, 215 East 7th Street, Des Moines, IA 50319 - no charge. A survey of Iowa energy and conservation issues.

IOWA SCIENCE TEACHERS' JOURNAL, a quarterly, is available free to science teachers requesting it on the school letterhead, c/o Managing Editor, ISTJ, Iowa Academy of Science, University of Northern Iowa, Cedar Falls, IA 50613. Volume 16, No. 1 (April 1979) focused on energy, with Iowa-specific information.

MOTHER EARTH NEWS is romantically "back to the land." It has interesting articles on unusual homes, low-energy life styles, recycling and bartering, "do-it-yourself" everything.

PEOPLE AND ENERGY is published monthly by Citizens' Energy Project, 1413 K Street NW, 8th Floor, Washington, DC 20005, $10. News of citizen action on energy and appropriate technology.

SCIENCE NEWS has weekly articles on energy research and technology.

MULTI-MEDIA MATERIALS

16 mm films, filmstrips, video cassettes and posters: The following items are a small, selected sample of the materials available on ENERGY.

For a broader listing of resources available to you at low or no-cost, contact your AEA, the media center of the nearest university, and the organizations listed in this publication. Also recommended is an excellent film bibliography, bound for library use and arranged by topics (What is Energy? Energy Issues and Options, Energy and the Environment, Energy Conservation, Sources of Energy). It is available at cost, $3, from New York State Alliance to Save Energy, 36 W. 44th Street, Room 709, New York, NY 10036. Ask for Energy on Film.

Filmstrips referred to in the ECAP's can be borrowed from your local AEA. In 1978, the AEA's received five sets of filmstrips. Some may have been sold to individual districts. Contact the DPI Energy Consultant if you are unable to locate a filmstrip through the AEA media center.

THE AMERICAN DREAM IS RUNNING OUT OF FUEL. 18 minutes, color, $230 or $19-rent (grades 5-8). Films, Inc., 1144 Wilmette Avenue, Wilmette, IL 60091.

American Gas Association, Dept. I-14, 1515 Wilson Blvd., Arlington, VA 22209, furnishes free 35 mm filmstrips. NATURAL GAS--SCIENCE BEHIND YOUR BURNER shows how gas gets from well to burner and comes with wall charts and worksheets. Other titles include, FUEL CELLS, HOW THE JET ENGINE WORKS, LOOK TO THE FUTURE, MORE TO COME (estimates of energy resources underground), SCIENTISTS WORK TOGETHER (case study of a fuel cell research project). Free films for teachers are available from the same source. ENERGY traces sources from the first fires to atomic power, outlines problems and proposes some solutions.

Association Films, Inc., 866 Third Avenue, New York, NY 10022 lends 16 mm movies free of charge. Examples of titles are MIRRORS OF TIME about a research ship exploring the ocean floor in search of gas and oil deposits; THE ENERGY BRIDGE about coal's potential to bridge the fuel resource gap; KING ZOB AND THE ENERGY CRUNCH about space heating and cooling conservation possibilities; UNSEEN JOURNEY about transporting crude petroleum.

BATE'S CAR: SWEET AS A NUT. 16 minutes, 16 mm, color, $250 or $30-rent, 1975 (grades 5-12). Arthur Mokin Productions, 17 W. 60th Street, New York, NY 10023. Presents the inventor's energy-saving inventions, particularly his methane-driven automobile. Highly recommended by AAAS.

COALMINING: THE STORY OF BURIED SUNLIGHT. Filmstrip #1, Part A, elementary, grade 5. Available through the local AEA.

Citizens' Energy Project, COMMUNITY SELF-RELIANCE POSTER, 1979, $4, from Citizens' Energy Project, 1413 K Street, 8th Floor, Washington, DC 20005. This colorful graphic displays a self-reliant community basking under the sun. Rehabilitated homes, bike paths, urban gardens, greenhouses, and a community health clinic are featured projects. Flip side lists resource people and other information.

CONSERVE YOUR ENERGY, a family energy diet kit (includes booklet, score card, poster) is available for $2 from Associated Press, 50 Rockefeller Plaza, New York, NY 10020.

C.U.R.E. (Citizens United for Responsible Energy) produced SOLAR ENERGY IN IOWA, a 22-minute slide show in 1977 which covers the basic principles of solar as well as projects in and near Iowa. A cassette and script is included. Rental for contribution from C.U.R.E., 3500 Kingman Blvd., Des Moines, IA 50312. 515/277-0253.

DOE Technical Information Center Film Library, P.O. Box 62, Oak Ridge, TN 37830, provides teachers with an annotated brochure on free energy films for classroom use. Write for your copy. Some titles that Iowa teachers have used and liked are LOOK TO THE SUN; SUN POWER FOR FARMS; THE ULTIMATE ENERGY and TO BOTTLE THE SUN (on fusion's potential); PUTTING THE SUN TO WORK (showing an innovative home); ENERGY, THE AMERICAN EXPERIENCE (which illustrates the historical relationship between economic growth, industry, and energy sources); CHALLENGE OF THE FUTURE; ON THE MOVE (about packing and shipping radioactive materials); POWER FROM THE EARTH (concerning geothermal energy); UP THE POWER CURVE, on conservation, covers a wide range of energy-saving ideas and estimates and savings from each; WORLD BEHIND YOUR LIGHT SWITCH tells in a non-technical way the story of production, transmission, and use of electricity.

ECOLOGY ACTIVITY CARDS are available from: BFA Educational Media, 2211 Michigan Avenue, Santa Monica, CA 90404. Some of the activities are related specifically to energy. Others in the box guide the children towards conservation and the idea of using our resources wisely.

ECOLOGY: UNDERSTANDING THE CRISIS is available from: Series No. 6454, c. 1972. Encyclopedia Britannica Educational Corporation, 425 North Michigan Avenue, Chicago, IL 60611. Filmstrip, records, guides generally cover what has caused the crisis, how man relates to his environment, plus a look into the future.

ENERGY: A FIRST FILM. 8 minutes, sound, color (grades K-3), BFA Educational Media, 2211 Michigan Avenue, Santa Monica, CA 90404.

ENERGY: ABILITY TO DO WORK. 9 minutes, color, sound (grades 5-8), AIMS Instructional Media Service, P.O. Box 1010, Hollywood, CA 90028.

ENERGY ALTERNATIVE OR FUTURE SOURCES OF ENERGY. Filmstrip #2, elementary grade 6. Available through the local AEA.

ENERGY AND ITS FORMS. U 25547, CORF-1961, 11 min. b/w, $5.60. Explains the basic concept of energy and shows examples of its principal forms, including nuclear energy. Introduces the idea of changing energy from one form to another to do work, and outlines the way in which plants convert the energy of the sun to chemical energy to provide a basic source of food and fuel. See "Iowa Films" listing for ordering information.

ENERGY AND WORK. US 25686, EBEC-1962, 11 min., color, $6.80. Explains through simple experiments that energy is neither created nor destroyed, but simply changed from one form to another. Illustrates a variety of these transformations and explains them in simple terms. See "Iowa Films" listing for ordering information.

THE ENERGY CHALLENGE - Kit, c. 1975. Pollution Control Education Center, Township of Union Public Schools, Union, NJ. Grade level undesignated, however, could be used in grade 6 with some modification and for the junior high. Contains student booklets, teacher's guide, two filmstrips with cassette, duplicating masters, activity cards, and overhead transparencies.

ENERGY CRISIS. U 30217, JOU-1972, 12 min., color, $8.30. Reviews our sources of energy and the length of time they may remain available. A hydro-electric plant, a conventional steamdrive electrical power plant and a nuclear power plant display how each generates power and its limitations. Concludes with possible solutions such as the "Fast Breeder Reactor" and "Fusion Reactor" which may someday provide unlimited power. See "Iowa Films" listing for ordering information.

ENERGY CRISIS GAME. 1973 (Upper elementary and junior high), Intemation, Inc., New York, NY 10001. For 2-6 players.

ENERGY DOES WORK. U 25548, CORF-1961, 11 min., b/w, $5.60. Billy, surprised to learn that when he is playing, he is doing work, is shown, by means of examples intended to appeal to the young child, that work is done whenever something is moved, that energy can be stored, and that food supplies energy to our bodies. See "Iowa Films" listing for ordering information.

ENERGY GAME. Northern Natural Gas produced a twenty minute slide-tape show followed by a quiz, designed for grades 4-6. The stress is upon energy conservation with a short review of where energy comes from. The kit is available through Northern Natural Gas, 503 Shops Bldg., Des Moines, IA 50309. 515/288-7463. No charge.

ENERGY HISTORY OF THE UNITED STATES 1776-1976 is a large, colorful wall poster for classroom use. Cost: $2.05 from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Stock No. 052-010-00459-0.

ENERGY IN IOWA. Filmstrip #1, Part B, elementary grade 5. Available through the local AEA.

ENERGY: PAST AND PRESENT, and ENERGY: FUTURE SUPPLY AND COSTS are slide-tape sets available free from Iowa State Extension Service. Call the county extension office to borrow copies.

ENERGY WITH A CAPITAL C - FOR CONSERVATION. Energy Policy Council, 707 East Locust, Des Moines, IA 50319. Slide presentation comes complete with slides, audience pamphlets, and a recorded cassette of the slide narrative.

FIRST FILM ON THE WIND. 9 minutes, 16mm, color, sound, c. 1966, (Elementary), BFA Educational Media, 2211 Michigan Avenue, Santa Monica, CA 90404. Shows how, though one cannot see the wind, he can see what the wind does, such as making waves on the water, swaying trees, and lifting kites. Shows how rain clouds come and go with the wind.

Iowa Films. Films listed as "Iowa Films" can be ordered by phone, by mail, or in person. (Collect calls accepted from Iowa.) Ask for film scheduling. The two locations of film centers are:

University of Iowa
Media Library
C-5 East Hall
Iowa City, IA 52242
319/353-5885
Hours: 8:00-5:00

Iowa State University
Media Resources Center
121 Pearson Hall
Ames, IA 50011
515/294-1540
Hours 7:30-12:00
1:00-5:00

Price list is the charge for three day rental. You are responsible for return postage. A written purchase order is required before shipment from the media resource person or business office of your school.

Iowa Energy Extension Service has several audio-visual resources available on energy conservation for no charge except return postage. Order from: Iowa Energy Extension Service, Iowa State University, 110 Marston Hall, Ames, IA 50011.

Films:

* THE GREAT ADVENTURE

A 30-minute color sound 16 mm production showing the potential for solar energy, emphasizing a variety of applications including

wind and the making of fuels from biomass products. Eddie Albert narrates. 1979. For general use. Produced by Department of Energy.

* A CITY FARMSTEAD

15 min., 16 mm color. Shows how one urban house uses solar, waste recycling and food production.

Slide Shows:

* PASSIVE SOLAR ENERGY

Six separate slide shows of 20 slides each on the following topics: general, direct gain, conservation aspects, thermal storage walls, attached greenhouses, water heating and roof ponds. Pictures and projects mostly from New Mexico. Developed by Dr. J. D. Balcomb. Script included.

* THE SOLAR QUEST

87 slides, 11 minutes, color. Documents how solar is being tapped for practical use in homes. Includes underground. Produced by The Polished Apple. Also available in filmstrip. Cassette tape accompanies. For general use.

* ENERGY FOR RURAL IOWA

20 minutes. Discusses research projects at Iowa State Univesity. #S851. Can be ordered through Media Resources. Includes wind, research house, alcohol, methane. Produced in 1979.

Living History Farms. SEEDS OF SURVIVAL, a 28-minute film portrays American farming of pioneers, and farmers in the 1900's and today. Energy reliance and sources are evident. The film is available for $3 from: The Grinnell Mutual Reinsurance Company, Public Relations Department, Grinnell, Iowa 50112; or Living History Farms, R.R. 1, 2600 NW 111th St., Des Moines, IA 50322.

MAN'S SEARCH FOR ENERGY. Filmstrip, 36 frames, $6.75, (grades 5-8), McGraw-Hill Films, 1220 Avenue of the Americas, New York, NY 10020.

Modern Talking Picture Service, 2323 Hyde Park Rd. New Hyde Park, NY 11042, offers a variety of free films produced by major industries as public relations/education efforts. Most of them are very professionally done; many are cinematic award winners. Write to the above address for their free lists. (Films are shipped from the Modern Library in Cedar Rapids.) A few of their other energy-centered movies available to junior and senior high schools are: WITHIN THIS EARTH, A MATTER OF ENERGY, MINING AND THE ENVIRONMENT, ENERGY VS. ECOLOGY, THE GREAT DEBATE, NUCLEAR ENERGY FOR TODAY AND TOMORROW, OFFSHORE, REFINERY, ENERGY IN PERSPECTIVE.

THE PETRIFIED RIVER. Film available from Iowa Electric Light Company.

RHR Filmedia, Inc., 1212 Avenue of the Americas, New York, NY 10036 will lend (free) the 16 mm color film, A QUESTION OF VALUES. This is the story of a small town's intense debate over potential benefits and dangers of a new oil refinery. Also, free on loan from the same source, THE HIDDEN ENERGY CRISIS explains that energy shortages may reduce supplies of petrochemicals commonly used in clothing, shelter, and food, and DOUBLE UP AMERICA explains benefits of carpooling.

Rienow, Robert. DARKNESS FOR OUR CITIES is an audiotaped plea for wasteful Americans to change their ways. It would be a useful introduction to an energy or conservation unit. Students will hear many possibilities for further research. Available for $14.95 from Center for Cassette Studies, Inc., 8110 Webb Avenue, North Hollywood, CA 91605.

Shell Oil Company Film Library, 1433 Sablier Circle West Drive, Indianapolis, IN 46239 will send you a list of films available on free loan. Some energy-related offerings are: THE FOSSIL STORY which emphasizes significance of fossils in the search for oil deposits; THIS LAND which explores the natural resources of North America, including oil and coal, and how they were formed; OIL, OIL WELL, and REFINERY PROCESSES which depict the source and processing of American's favorite fuel; and FOOD OR FAMINE which illustrates methods of improving agriculture around the world.

Union Carbide Corporation, Public Affairs, 1730 Pennsylvania Avenue NW, Washington, DC 20006 will provide a free wall chart listing nearly 500 NON-FUEL USES FOR OIL.

U.S. Department of Commerce, Office of Energy Programs, Room 3011, Washington, DC 20230 will lend (free) the 16 mm color film on ENERGY: CRITICAL CHOICES AHEAD, a discussion of energy supply and demand through the year 2000.

ORGANIZATIONS AND RESOURCES

If you have the energy to write a few letters on school stationery, the following organizations will fill your mailbox with free or low-cost information on energy topics.

American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209 has an energy newsletter, films, ditto masters, and a variety of free literature free to teachers who request them on school stationery.

American Petroleum Institute, Information Service Department, 2101 L Street NW, Washington, DC 20006 provides an abundance of colorful materials for classroom use, free on request, including movie loans.

American Public Gas Association, Watergate Office Bldg., 2600 Virginia Ave. NW, Washington, DC 20037 provides free educational materials on request.

American Wind Energy Association, 1621 Connecticut Avenue NW, Washington, DC 20009 will send a brochure of general information about windmills, an invitation to join the club, and a list of publications available on the subject of wind machines.

Area Education Agency (AEA) has films, filmstrips, book catalogs and other resources for energy education. Contact the nearest one.

Association of Home Appliance Manufacturers, 200 N. Wacker Drive, Chicago, IL 60606 provides free "Energy Data" on typical operational costs of home appliances.

Atomic Industrial Forum, Public Relations Department, 7101 Wisconsin Avenue, Bethesda, MD 20014 will send information on nuclear power plants, including black-and-white graphics (for easy reproduction) diagramming various types of reactors.

Chamber of Commerce may be able to help locate solar buildings, alternative energy-related businesses, knowledgeable members of the community who may cooperate on an energy project for the class.

Citizens' Energy Project, 1110 - 6th St., NW, #300, 8th floor, Washington, DC 20001 researches and publishes comprehensive, low-cost reports on dozens of energy resources. Write for current list of titles.

Citizens United for Responsible Energy (CURE) 3500 Kingman Blvd., Des Moines, IA 50311, Tel. 515/277-0253, maintains a roster of speakers on energy topics and publishes a newsletter that often features "solar successes."

Cooperative Extension Service, 110 Curtis Hall, Iowa State University, Ames, IA 50011 has many bulletins and pamphlets on energy conservation available for the asking. Write or call 515/294-4576.

Edison Electric Institute, Public Relations Department, 90 Park Avenue, New York, NY 10016, provides information on all forms of electrical generation and a series of useful handbooks of energy-related experiments for the classroom.

Energy and Education Action Center, Room 514, Reporters Building, 300-7th St. SW, Washington, DC 20202, serves as an information center and data distribution network centered on energy-education materials and conservation measures.

Energy Extension Service, 110 Marston Hall, Iowa State University, Ames, IA 50011, has information and programs for schools and communities. Write or call 515/294-4266 for an up-to-date list of services.

Energy Research and Information Foundation, 3500 Kingman Blvd., Des Moines, IA 50311. ERIF is a non-profit corporation to promote and conduct research and educational projects as well as to provide information. Programs include Energy Sources, Kill-A-Watt, and a Traveling Solar Display. Phone: 515/277-0968.

Environmental Action Foundation, The Dupont Circle Bldg., Suite 724, Washington, DC 20036 will send a resource guide on electric utility issues.

Environmentalists for Full Employment, 1101 Vermont Ave N.W. #305, Washington, DC 20005 has published Jobs and Energy ($2 for individuals) and Jobs and Energy Update (50 cents each), exploring the impact of energy use transitions and alternative energy sources on employment. They advocate conservation and diverse solar systems as the best answers to the related problems of unemployment and the capital drain made by corporate energy industries.

Ethyl Corporation produces an annual Ethyl Digest on an energy topic. Get a free copy by writing to Ethyl, Corporate Public Relations, 330 South Fourth St., Richmond, VA 23217.

Ideas and Information Center, Iowa-Illinois Gas and Electric Company, 1403 Kimberly Road, Bettendorf, IA 52722. Phone 319/326-7054. Educational materials and answers to specific questions on local utility rates, consumption patterns, and insulation guidelines.

Institute for Local Self-Reliance, 1717 - 18th St. NW, Washington, DC 20009. This non-profit educational and research group explores possibilities of urban communities becoming productive, self-reliant systems. Write for their list of publications on topics like "A Neighborhood Energy/Food/Waste System," "Dawning of Solar Cells," "Neighborhood Power," and various food production concerns.

International Solar Energy Society, American Section, 12441 Parklawn Drive, Rockville, MD 20852 maintains a bibliography of solar and other renewable energy sources.

Iowa Academy of Science, University of Northern Iowa, Cedar Falls, IA 50613 publishes the quarterly Iowa Science Teachers Journal.

The April 1979 issue featured several energy-education articles including "Wind Energy in Iowa." This one issue is available free to science teachers using school stationery for their request to the Editor, ISTJ. Subscription rate is $4/year.

Iowa Center for Local Self-Reliance, 3500 Kingman Blvd., Des Moines, IA 50311. The center is trying to research, demonstrate and educate the public about technologies and social structures which lead to self-reliance such as solar energy, energy conservation, organic gardening, recycling, and water conservation. Demonstrations, pamphlets, programs and consultations are offered. Phone: 515/277-0968.

Iowa Energy Policy Council, Lucas Bldg., Capitol Complex, Des Moines, IA 50319 has up-to-date information on energy use in Iowa and booklets on a variety of energy topics. Hotline: 515/281-4306.

Iowa Solar Office, Iowa Energy Policy Council, Capitol Complex, Des Moines, IA 50319 has solar energy information and materials including publications, films, a speakers bureau, consumer materials and lists of Iowa solar businesses and architects. Phone: 800/532-1114.

Iowa Solar Energy Association, 1433 Wildwood Drive, Cedar Rapids, IA 52402, 319/365-6103 may be able to provide you with resource persons who are knowledgeable about solar technology.

League of American Wheelman, 19 S. Bothwell, Palatine, IL 60067 provides information on ways and means of improving conditions for bicycling.

League of Women Voters of the United States, 1730 M Street NW, Washington, DC 20036 has a catalog of their own free or low-cost energy publications. Revised annually, this catalog is available from "Energy Department Publications" at the above address.

National Coal Association, 1130 Seventeenth Street NW, Washington, DC 20036, has articles, booklets, films, and other aids available on request that discuss the past, present, and future of coal.

National LP-Gas Association, 1800 North Kent St., Suite 1004, Arlington, VA 22209, provides free information about their products.

National Petroleum Council, Director of Information, 1625 K Street NW, Suite 601, Washington, DC 20006, provides free literature on various aspects of getting and using petroleum.

National Science Teachers Association, 1724 Connecticut Ave., NW, Washington, DC 20036 will send any teacher their bimonthly newsletter Energy and Education (free) plus a list of other energy publications.

National Solar Heating and Cooling Information Center, P.O. Box 1607, Rockville, MD 20850 publishes many handsome no-cost brochures and books, like "Passive Design Ideas for the Energy Conscious Consumer." You can call this group toll-free at (800) 523-2929.

National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 sells reprints of many otherwise-difficult-to-locate publications on a wide variety of energy topics. Write for a free list of publications.

National Wildlife Federation, 1412 - 16th St. NW, Washington, DC 20036 has conservation education publications and selected resource materials for developing energy education programs.

Public Interest Research Group, P.O. Box 19312, Washington, DC 20036 can provide information on Energy Alternatives.

Shell Educational Services, Shell Oil Company, P.O. Box 2463, Room 1541, One Shell Plaza, Houston, TX 77001 can provide energy education materials.

Sierra Club, Information Services, 1050 Mills Tower, San Francisco, CA 94104 will provide an Energy Packet for $1. This collection of articles includes "Solar Energy Now," and "Geothermal Energy" among several others.

U.S. Government Printing Office, Washington, DC 20402, offers many energy-related publications at prices from $1 to $10. Write to the above address and ask for Subject Bibliography Index and Price List 36 which contain information for selecting materials pertinent to energy-environmental issues.

Utility and/or Power Companies often have pamphlets and filmstrips, and sometimes posters, games, and lesson plans available to teachers.

Volunteers in Technical Assistance (VITA), 3706 Rhode Island Ave., Mt. Rainier, MD 20822 publishes technical bulletins on do-it-yourself technology including solar, hydro, and wind-powered projects. Bulletins are well illustrated, clearly written, and range in price from $1 to $6. Write for a free list of titles.

ENERGY IN OUR HOMES

ENERGY IN OUR SCHOOL

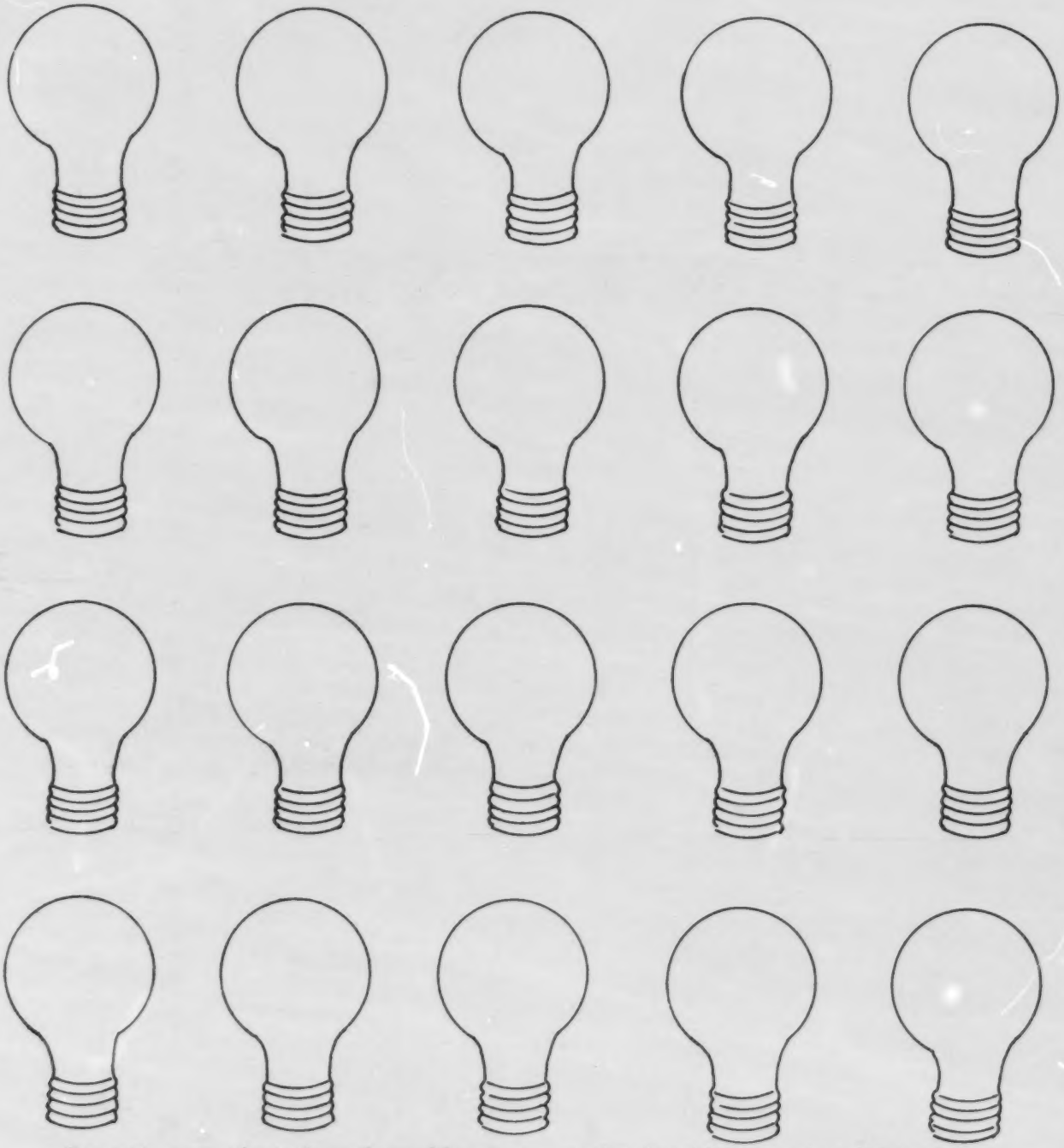
WAYS I USE ENERGY

MY ENERGY USERS

		Those I Own or Use		Type of Energy
(example)	1.	clock-radio	1.	electricity
	2.		2.	
	3.		3.	
	4.		4.	
	5.		5.	
	6.		6.	
	7.		7.	
	8.		8.	
	9.		9.	
	10.		10.	

ELECTRICAL APPLIANCES IN MY HOME

With the help of your family, list all the electrical appliances in your home. Now, go back and number them in the order of their importance to you.



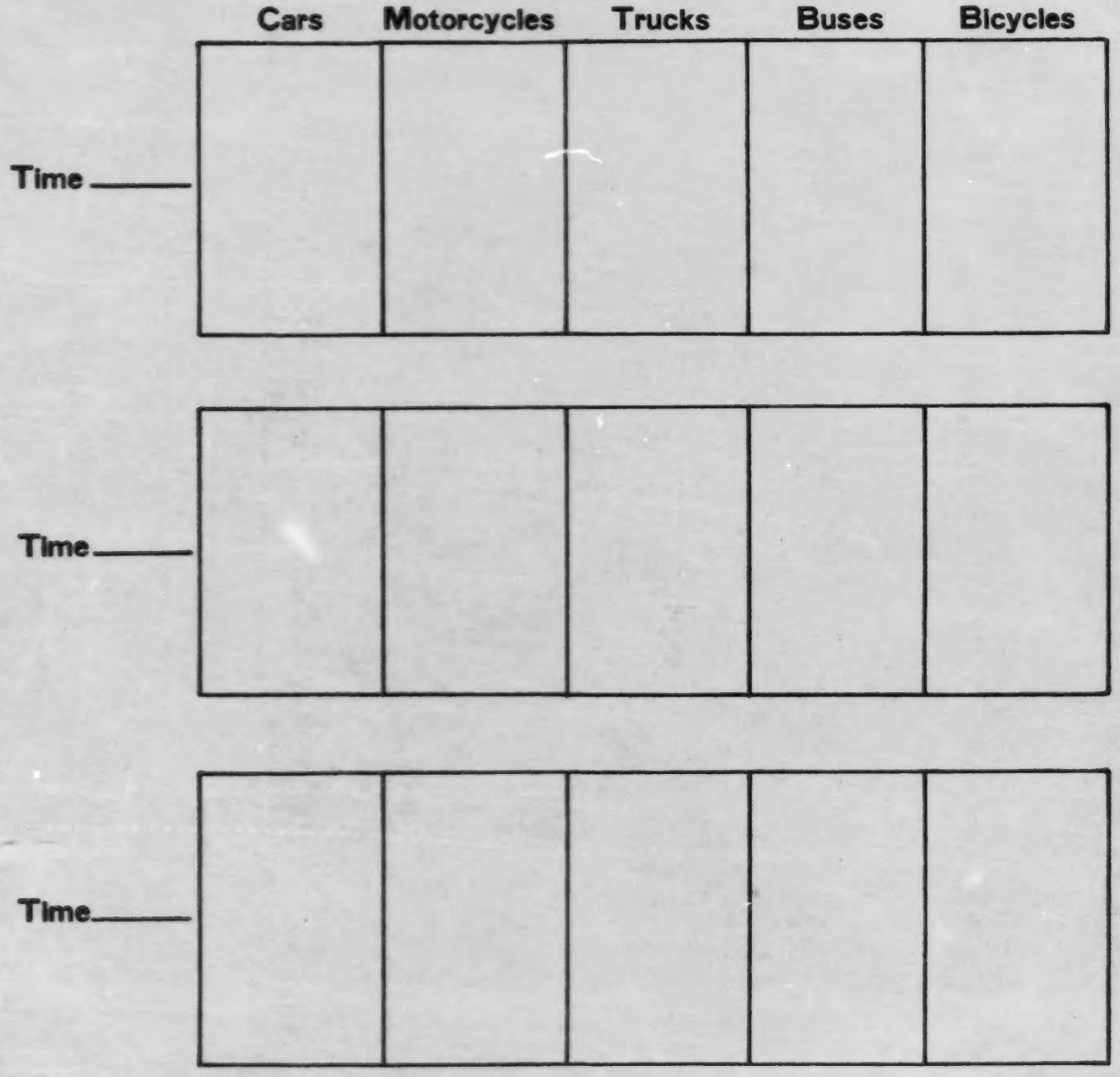
Now put an x through each appliance you could do without and still have a good life.

TRAFFIC SURVEY

	Time _____				Time _____				Time _____			
	Cars	Trucks	Buses	Motor-cycles	Cars	Trucks	Buses	Motor-cycles	Cars	Trucks	Buses	Motor-cycles
Day #1												
Day #2												
Day #3												
Day #4												
Day #5												

Each time you see a car that has only one person in it, put a check(✓) below.

TRAFFIC SURVEY



SHADOW SEARCHING

Team: _____

Time of Search: _____

Side of building	Where was the shadow cast?	What made the shadow?	Describe the shadow: How dark?	How big?	What shape?

1. How were shadows different on different sides of the building?

2. What made the darkest shadow?

3. What cast the lightest shadow?

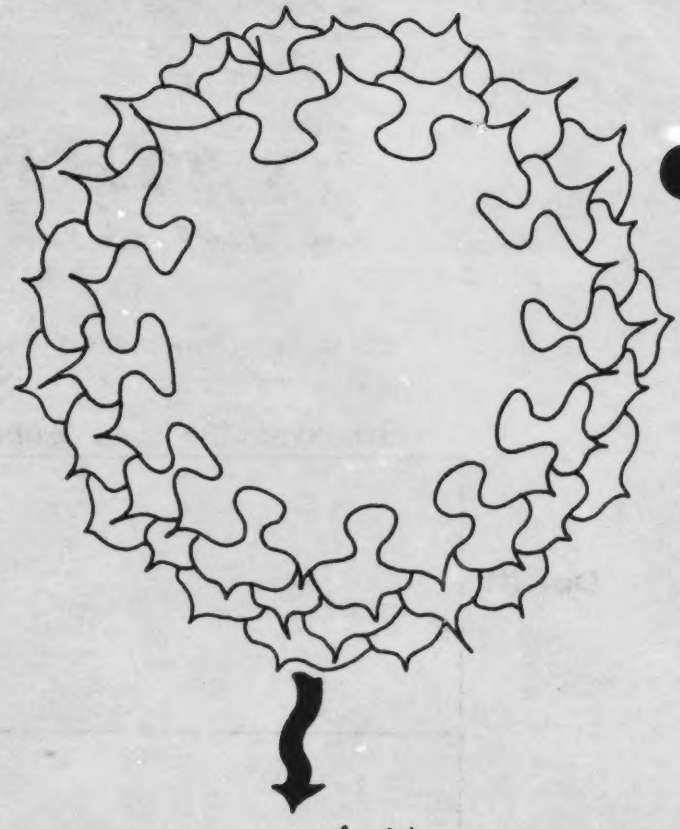
4. When and why are dark and light shadows important to us?

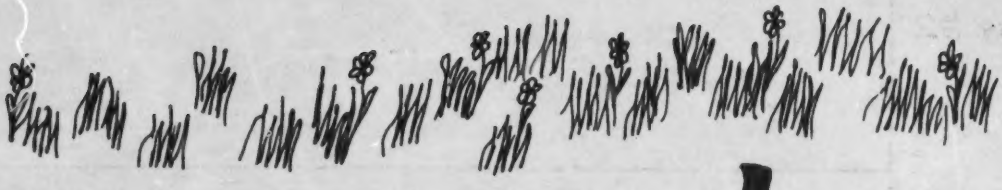
Grade 3
Packet "A"
Data Sheet #5
Activity G (1.2) pg. 7

ENERGY FOR GROWTH

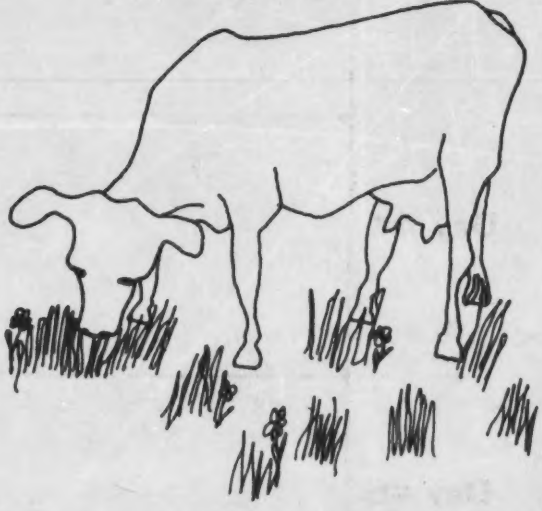
List the foods you eat each day. Also include the amounts (1 glass milk, 2 slices bread, 1 bowl cereal, etc.)

	Breakfast	Lunch	Supper	Snacks
Day #1				
Day #2				
Day #3				
Day #4				
Day #5				





ENERGY PATH



HOW DOES YOUR FAMILY RELAX?

List the activities for each member of your family and tell what sources of energy are needed for each activity. *Use the back for additional brothers and/or sisters.

Example: swimming — body energy (food), gasoline (car) — electricity (heated pool, dryer for towels)

Mom

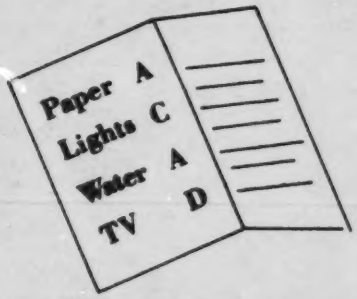
Dad

Brother

Sister

Me

MY ENERGY REPORT CARD



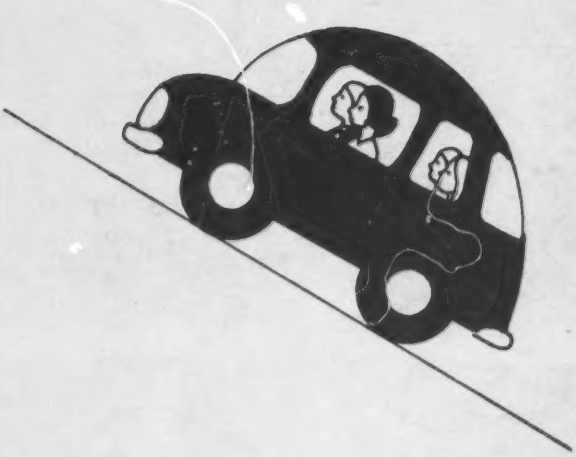
Name _____

Week _____

	Need No Improvement	Need a Little Improvement	Need Lots of Improvement
Ways I Save Energy in School			
• Conserve paper			
• Conserve crayons			
• Conserve pencils			
• Conserve paper towels			
• Turn off lights if not being used			
• Other			
Ways I Save Energy at Home			
• Conserve food			
• Conserve water			
• Conserve _____ (Fill in other items students tend to waste)			
• Turn off lights when not being used			
• Turn off radio and TV when not in use			
• Keep doors and windows closed in cool or cold weather			
• Wear warmer clothes in cold weather so the temperature does not have to be so high			
• Other			

Energy Activities
Grade 3
Packet "A"
Master #4
ctivity B (2.2, 2.3), pg. 10

WHAT IS WASTING ENERGY?

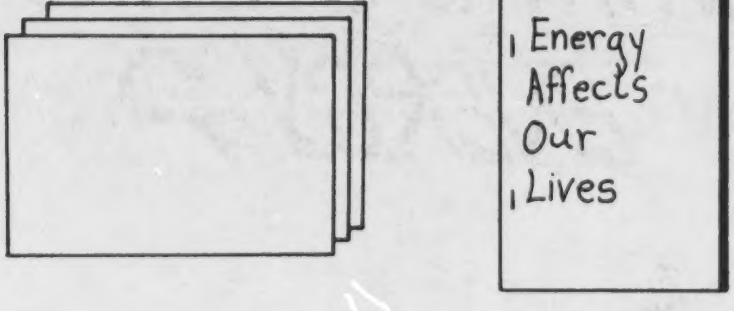


ENERGY AFFECTS OUR LIVES

Materials: sheets of construction paper, glue, scissors, old magazines, catalogs, and advertisements

Make a Booklet!

Use 3 sheets of construction paper to make the booklet.



Staple together

Use the title at the top of this page for the cover of your booklet.

Find pictures which show the many uses of energy in the United States today. Cut them out and glue them into your booklet.

Write your name and the date on your booklet before putting it in the basket on this table!

WHY USE ?

Materials: paper, pencil, tape recorder if you wish

Interview your parents, neighbors, friends!

Think of some questions to ask before you talk to these people. If you are using paper and pencil write down their answers to your questions. If you use the tape recorder just remember to turn it on before you begin talking!

Sample questions

1. Do you have many electrical appliances in your home?
2. Do you use them often?
3. What could you do without?
4. Why don't you want to give up the convenience items that use electricity?
5. What would you do to conserve energy?

Put your paper or tape in the basket when you finish.

IS THERE A SHORTAGE?

Materials: paper, pencil, tape recorder if you wish.

Interview people in the community!

Choose a department store manager, industry foreman, grocery store manager, mayor, and a few others to interview.

Ask these people if they have felt any energy shortages and what these shortages were. Ask them what energy they use and how they think it affects the environment.

Place your paper or tape in the basket when you finish.

MAKE A POSTER

Materials: large sheet of paper, crayons, glue, scissors, paint, chalk, or marking pens, sheet of scrap paper, pencil, ruler, scraps of colored construction paper

1. Use a piece of scrap paper to plan your design showing how to save energy. You may wish to show saving energy in school, in your home, or in your town.
2. Decide whether you will draw and color the picture, or whether you will cut designs out to glue on.
3. Be neat! Keep your poster simple and colorful!
4. Write your name and the date on the back of the poster before you hand it in.

WHAT CAN YOU DO?

Materials: sheet of paper and pencil, stars

On your sheet of paper make a list of all the things you plan to do to save energy in school. You could make it like a chart.

Keep your chart handy and each day for one week put a "*" for each thing you remembered to do and a "-" for each item you did not do.

At the end of the week make certain your name is on the chart and hand it in.

Energy Activities
Grade 3
Packet "B"
Transparency #1
Activity A, 1.1, pg.16

1. Anaheim, California
2. Atlanta, Georgia
3. Baltimore, Maryland
4. Boston, Massachusetts
5. Buffalo, New York
6. Chicago, Illinois
7. Cincinnati, Ohio
8. Cleveland, Ohio
9. Dallas, Texas
10. Detroit, Michigan
11. Houston, Texas
12. Kansas City, Missouri
13. Los Angeles, California
14. Milwaukee, Wisconsin
15. Minneapolis, Minnesota
16. New York, New York
17. Newark, New Jersey
18. Paterson, New Jersey
19. Philadelphia, Pennsylvania
20. Pittsburgh, Pennsylvania
21. St. Louis, Missouri
22. San Diego, California
23. San Francisco, California
24. Seattle, Washington
25. Washington, D.C.

Energy Activities
Grade 3
Packet "B"
Transparency #2
Activity B (1.1), pg. 16

coal

iron

silver

oil

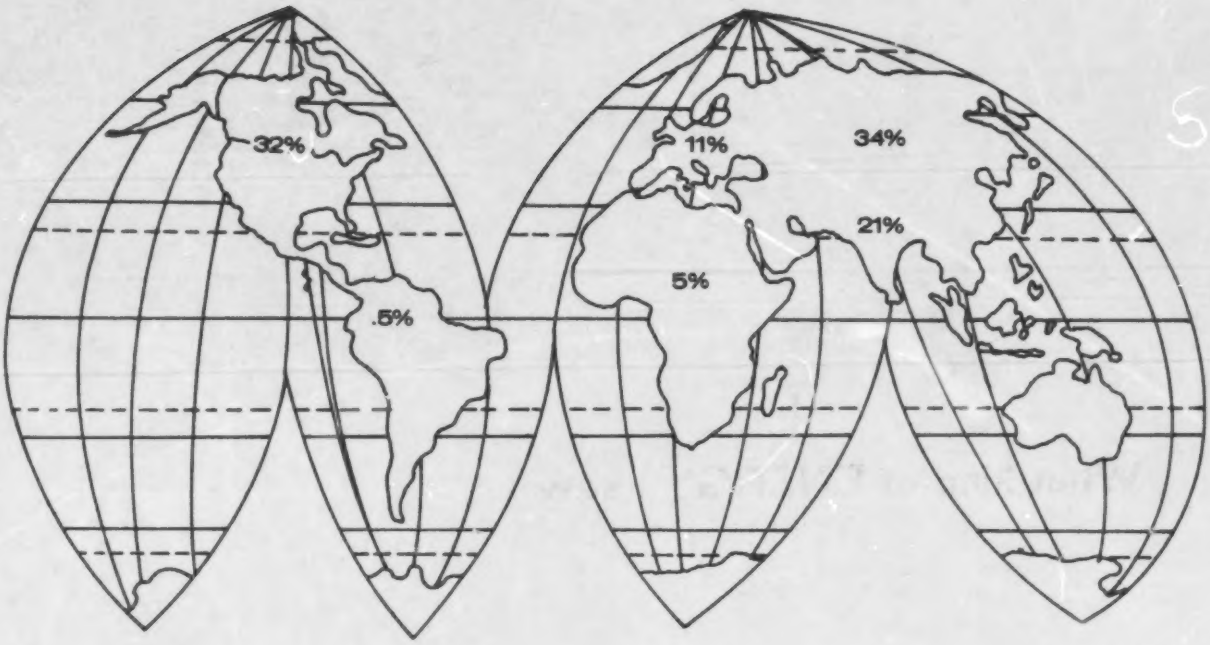
ENERGY WALK

Where I saw ENERGY

What kind of ENERGY I saw

Energy Activities
Grade 3
Packet "B"
Transparency #3
Activity A (1.2), pg. 17

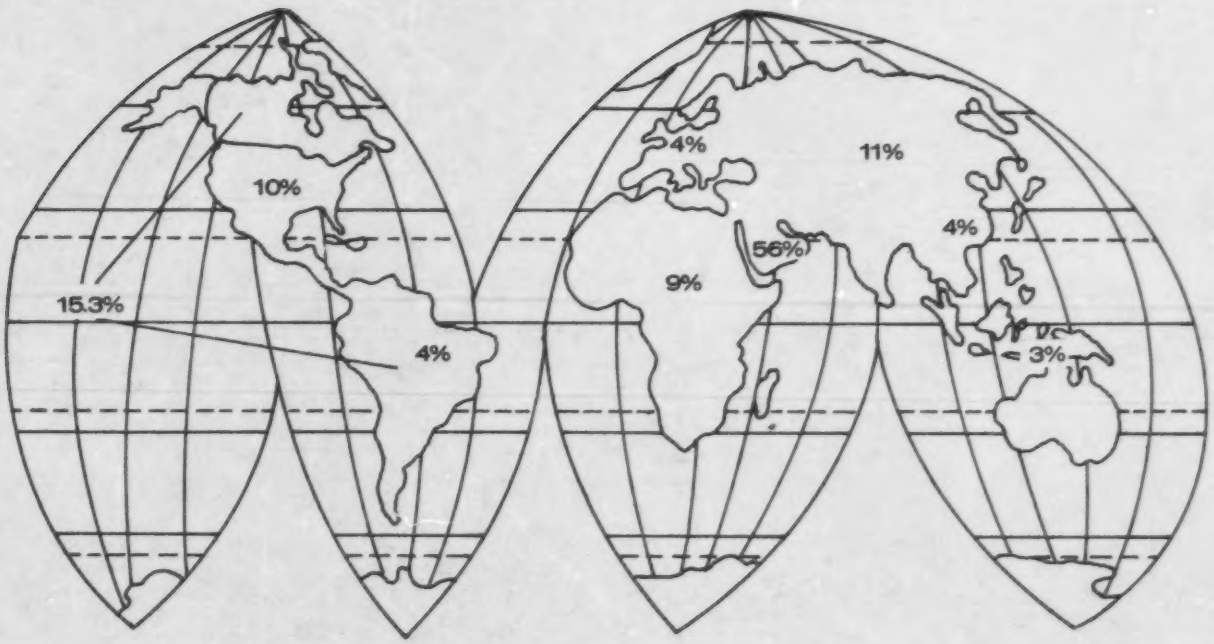
World Distribution of Coal



SOURCE:

U.S. Dept. of Energy
Annual Report to Congress
1979 — Vol. 2

World Distribution of Crude Oil

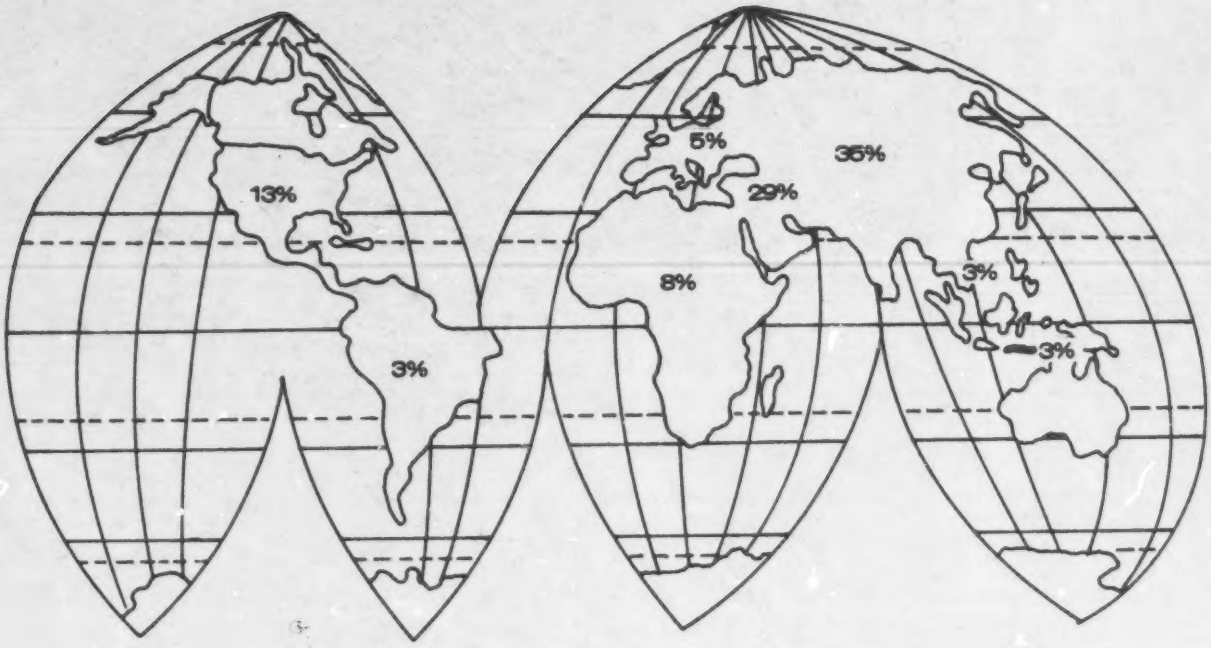


SOURCE:

U.S. Dept. of Energy
Annual Report to Congress
1979 — Vol. 2

Energy Activities
Grade 3
Packet "B"
Transparency #5
Activity A (1.2), pg. 17

World Distribution of Natural Gas

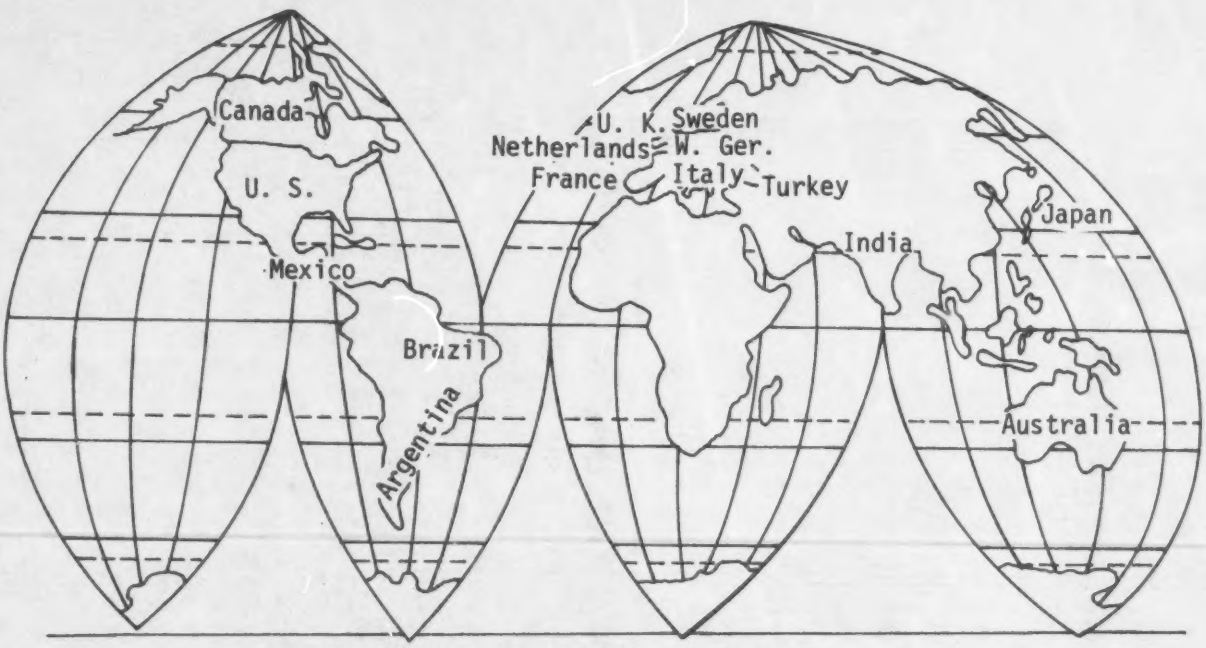


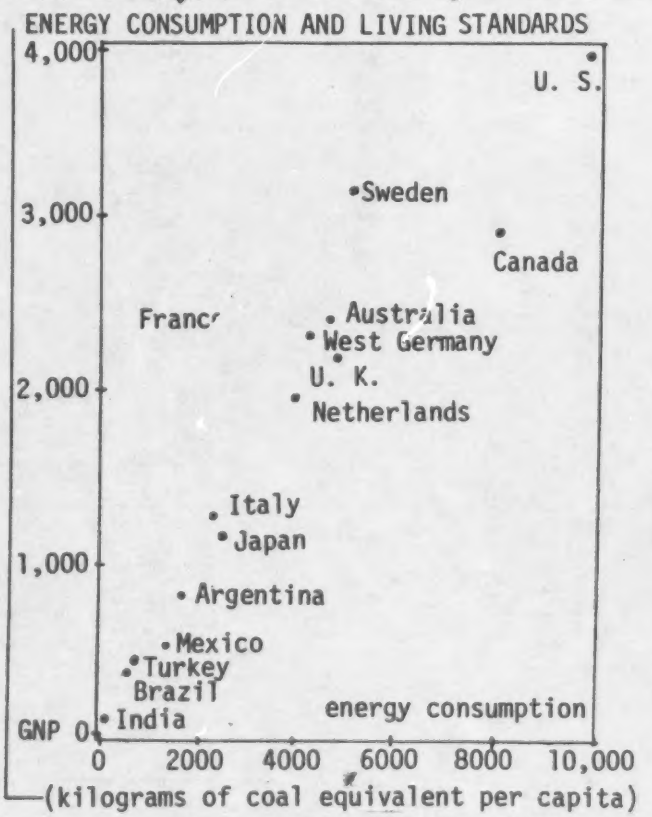
SOURCE:

U.S. Dept. of Energy
Annual Report to Congress
1979 — Vol. 2

Energy Activities
Grade 3
Packet "B"
Transparency #6
Activity B (1.2), pg. 17

ENERGY USERS





Energy Users
U. S.
Canada
U. K.
Australia
Sweden
W. Germany
Netherlands
France
Japan
Italy
Argentina
Mexico
Turkey
Brazil
India

ENERGY PUZZLE

E	L	E	C	T	R	I	C	I	T	Y
Q	E	L	E	C	T	R	I	C	L	F
P	D	D	S	F	G	O	N	A	C	U
S	B	U	O	U	Y	A	C	R	L	R
X	T	E	L	E	V	I	S	I	O	N
W	C	O	D	L	I	B	F	H	C	A
I	O	F	V	U	M	K	O	R	K	C
N	R	B	M	E	S	H	O	E	S	E
D	N	O	I	L	A	Z	D	Q	I	V
M	W	Z	L	C	L	O	T	H	E	S
I	G	A	K	N	Y	L	O	N	S	B
L	A	J	T	F	U	C	A	N	D	Y
L	H	D	X	E	W	Y	L	O	P	A
H	O	U	S	E	R	T	Z	E	S	W

Find these words in the puzzle and circle them.

- stove
- house
- electricity
- television
- clothes
- car
- furnace
- bed
- bicycle
- food
- clock
- nylons
- shoes
- windmill
- water
- electric
- fuel
- gas
- oil
- candy
- milk
- corn

WANTS NEEDS ENERGY

WHY MORE ENERGY?

Now	1940-1945	1915-1920	
☐	☐	☐	TV set
☐	☐	☐	vacuum cleaner
☐	☐	☐	clothes dryer
☐	☐	☐	electric dishwasher
☐	☐	☐	electric toothbrush
☐	☐	☐	radio
☐	☐	☐	electric razor
☐	☐	☐	electric mixer
☐	☐	☐	phonograph
☐	☐	☐	air conditioner
☐	☐	☐	freezer
☐	☐	☐	refrigerator
☐	☐	☐	central heating
☐	☐	☐	automatic washer
☐	☐	☐	electric or gas stove
☐	☐	☐	blender
☐	☐	☐	power mower

ALTERNATIVES

Think of something and then think of what could be used in place of the first item. A few examples are listed.

vacuum	broom
car	bicycle

CONSERVATION

Name _____

Sometimes our natural resources begin to get low and we have to replace them with something else or use them wisely. Complete each sentence as completely as you can.

1. To save gas we can _____
2. To conserve electricity we can _____
3. To save paper we can _____
4. To lower our utility bills we can _____
5. To create less waste we can _____

Dear Parents,

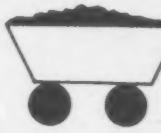
Your third graders have been eagerly learning about energy and the ways in which it affects our lives. They have also been trying to learn where the energy sources are located. One of our biggest projects is to learn what we can do to conserve energy and use it more wisely.

Please use the following questions to begin a family discussion. Your children will enjoy the opportunity of talking with you about what they have learned and ways it will affect their lives. Feel free to add to this list of questions and expand your discussion as the need arises.

Thank you.

1. How does energy affect growth? Our growth? That of our country?
2. How is a food chain concerned with energy?
3. Do we use energy in a way that is harmful to our environment?
4. Will the way we live change if we use less energy?
5. What could we do to use less energy in our leisure time?
6. What are some "wants" we could do without that would conserve energy?
7. Are there ways we can conserve energy at home?
8. What are some ways we could use the car less?
9. Would recycling help to conserve energy? How?

CONSERVATION QUIZ

Black and White TV	Room with Thermostat Set at 68° or Below	Car Pool	Do Not Use an Electric Toothbrush	 Free Space
Compact Car	Free Space	Turn Lights Off When Not in Use	Do Not Use an Electric Blanket	Grow a Garden in the Summer
Recycle Papers, Glass, Metals	House with Storm Windows	Fluorescent Lights	Turn Off TV When No One Is Watching	Buy Soft Drinks in Returnable Containers
Hang Clothes Out to Dry	Wash Clothes Once a Week	Ride Bicycle Instead of in the Car	Free Space	Wash Clothes in Cold Water
Free Space	Wear Warm Clothing in Winter	Have Only One Car	Do Not Use a Snowblower in Winter	Take Vacations Close to Home

Use a yellow crayon to shade in each square that is true for you and your family. How many can you fill in?

PATTERNS GRID

What procedures do you follow about this activity?	Is it a pattern?		Is it done out of			Do you feel good about your answers?		
	Yes	No	Compulsion	Habit	Free Choice	Yes	No	???
1. Taking showers or baths?								
2. Using the escalator or stairs?								
3. How you brush your teeth?								
4. Watching movies on TV?								
5. Type of sports activities?								
6. Turning off lights when not in use?								
7. Riding in a car to school?								
8. Using paper wisely?								
9. Using your leisure (free) time?								
10. How high the thermostat in your house is set?								
11. Wearing warm clothes in cold weather?								

CCEnergy Activities
4. Grade 3
Packet "B"
Master #6
Activity E, 2.3, pg.20

I learned that I...

I re-learned that I...

I noticed that I...

I discovered that I...

I realized that I...

I was surprised that I...

I was pleased that I...

I was displeased that I...